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(54) A method and means for transmitting a service page in a communication system

(57) The transmission of a service page according to the present invention provides for versatile data to be displayed on a display of a terminal, which is in contact with a telecommunication network, on the basis of CLIP or CoLP identifier information. This is implemented, for example, so that after having received (31) the CLIP identifier information, characteristic of a subscriber A, a subscriber B contacts a server (32), through a telecommunication network, and transmits (33) to it the CLIP information on the subscriber A. On the basis of this, the server transmits to the subscriber B the address of a service page (37), characteristic of the subscriber A, provided that it is located in a database (34, 35). After this, the subscriber B retrieves (38), from an Internet address (37) it has received, the service page, characteristic of the subscriber A, and displays it on its display (39).

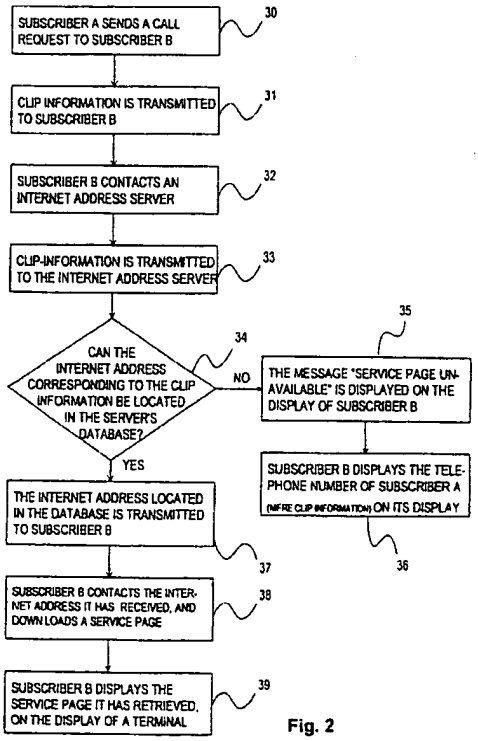

Fig. 2

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Description

The present invention relates to a method and means for transmitting service pages implemented in a telecommunication network, such as in an Internet network, to a terminal. The invention is suitable for use particularly in connection with portable terminals, such as mobile stations.

Digital telephone exchanges and terminals, such as telephones of a wired network and mobile stations, provide for a number of new services to be utilised. One of them is the commonly used identification service of a caller (subscriber A), i.e., the CLIP (Calling Line Identification Presentation) service. With the help of this service, the identifier of the subscriber A, substantially the telephone number of the subscriber A, is transmitted to a receiving terminal (subscriber B), wherein it is typically displayed on the display of the terminal of the subscriber B. On the basis of this information, the subscriber B can see from which number the call is coming. It is also very common that the most frequently used telephone numbers and the names and other identifiers of the corresponding persons have been stored in the terminal of the subscriber B. This function is used particularly in mobile telephones, wherein it is possible to display, on the display of the terminal of the subscriber B, the name or some other identifier of the subscriber A, e.g., the name of the subscriber A's company, on the basis of the telephone number of the subscriber A. Another new service provided by digital telephone networks is the so-called CoLP (Connected Line Identification Presentation) service. This service transmits to the caller (subscriber A) information on what is the actual identifier (telephone number) of the opposite end (subscriber B) of the connected line. With the help of this service, the subscriber A receives information on the subscriber B's actual telephone number of that moment even if the subscriber B has carried out a call transfer.

The supplementary services relating to the identification of a line, such as the CLIP and CoLP services presented above, defined in the GSM mobile telephone system, have been presented in the GSM Standard GSM 02.81 of the ETSI (European Telecommunications Standards Institute). It defines, amongst other things, in which form the CLIP and CoLP data are transmitted in the GSM system. Both the CLIP and CoLP services contain an extremely limited amount of information. It would be useful if, in addition to the CLIP and CoLP services, it would also be possible to transmit other information.

An increasing number of companies and corporations, in particular, but also private persons have taken into use services based on the Internet network. Due to advanced terminals and more efficient network connections, it is possible to transmit, in the Internet network, various kinds of data including speech and video pictures. Hypermedia pages that have been implemented in the HTML (Hypertext Markup Language) in a WWW (World Wide Web) environment have become particularly popular. On these hypermedia pages, it is possible to create interactive documents or purely informative service pages. Similarly, the pages can also be used for advertising or for providing the address or personal data of a company or a private person possibly together with maps and pictures.

The Internet network consists of a number of servers and telecommunication networks, which transmit messages in a digital form. The messages, such as, e. g., hypermedia pages, are transferred as files from one server to another and finally to a receiving terminal. The HTTP (HyperText Transfer Protocol) is commonly used for data transmission, the protocol transmitting the information intended for transfer in a form of a packet between the terminals on the basis of a URL (Uniform Resource Locater) address information characteristic of each terminal.

A method and means have now been invented by means of which it is possible to utilise service pages provided by a telecommunication network, e.g., the Internet network, by means of wired or wireless terminals coupled to the telecommunication network, on the basis of supplementary services, such as the CLIP and CoLP services presented above, relating to line identification. The service pages may contain, e.g., text, graphics or moving video pictures. In a communication system according to the present invention, it is possible to transmit service pages according to several principles. In a first embodiment, a caller (subscriber A) can link the address of the desired service page (in the Internet network, a URL identifier) with the subscriber's own identifier (in the GSM system, with the information transmitted by the CLIP service, i.e., one's own telephone number), on the basis of which a receiving terminal (subscriber B) can retrieve the selected service page from the telecommunication network and display it on the display of the receiving terminal. This method can be utilised, e.g., for advertising purposes, whereupon a teleseller transmits additional information to the customers called. In a second embodiment of the present invention, a receiving terminal (subscriber B) links, on the basis of the telephone number of a subscriber A, the service page he has selected with the number in question and retrieves the service page to his own display. This proceeding is suitable, e.g., for a seller (subscriber B) receiving calls for presenting customer data, whereupon he can, on the basis of the caller's CLIP information, retrieve from his own or the company's database the caller's (subscriber A) volume of orders in hand, prices or even credit information.

The chapter above presented different embodiments of the present invention, wherein the desired service page was retrieved from the subscriber A on to the display of the subscriber B on the basis of the CLIP service transmitted to the subscriber B. Similarly, the desired service page can be transmitted on the basis of a CoLP service. In a third embodiment of the present invention, a service page selected by the subscriber B,

which can be used, e.g., for advertising purposes, is transmitted on to the display of the subscriber A. This embodiment is suitable, e.g., for situations, where a customer calls the telephone number of a company providing certain products or services and receives automatically to his terminal additional information on the products or services provided by the company in the form of a service page. However, the use of the CoLP service instead of the CLIP service gives one advantage. The subscriber A, at whom the advertisement is directed, can be certain of the advertisement's origin because, for example, call transfers implemented in a telephone network cannot affect the authenticity of the CoLP service. This method is also extremely suitable for key telephone systems, wherein it is possible to implement, e.g., in a hospital on duty, a service which automatically tells the subscriber A the contact information, rank and, for example, the special expertise of the person who has answered the key telephone. On the basis of this information, the customer knows to whom he is speaking and can ask the call to be transferred to another person if necessary.

In a fourth embodiment of the present invention, a service page that he himself has selected is transmitted to the subscriber A on the basis of the CoLP service. This enables, for example, the expansion of the teleselling application presented in the second embodiment of the present invention so that the customer's volume of orders in hand, prices or even credit information, stored in the company's database, are also automatically available when a seller acts as the subscriber A, i.e., calls the customers (subscribers B). This system is safe, because the reliability of the CoLP information guarantees that the seller can be certain with whom he is doing business. However, nothing prevents the seller application presented above from being further expanded so that said service page is transmitted to both the seller and the customer, whereupon they can refer to the same database during the discussion. In this case, however, safety factors (e.g., to prevent credit information and/or other information intended for the company's internal use from being transmitted) should be taken into consideration.

In the embodiments of the present invention presented above, a reference table, typical of the invention, is required, wherefrom a URL address of the desired service page is retrieved on the basis of the information transmitted by the CLIP or CoLP service. The reference table can be located in different servers of a telecommunication network (e.g., the Internet), in servers implemented in connection with a telephone exchange or a private branch exchange, in a company's own data network (e.g., intranet) or in a user's own computer. It is also possible to store the reference table, e.g., in the memory of a portable terminal, such as a communicator like the Nokia 9000 Communicator. In this case, the transmission of the service page speeds up, because it is not necessary to retrieve the URL address of the service page from the server implemented in connection with the telecommunication network or the telephone exchange, but the communicator can down load the desired service page directly from the URL address it has retrieved from its memory.

Thus, the transmission of a service page in a communication system according to the present invention enables, amongst other things, an Internet home page, characteristic of each individual or company, to be displayed on the display of the terminal of the subscriber B instead of the telephone number or the name of the subscriber A. Hence, the present invention provides versatile and flexible opportunities to increase the amount of information transmitted on the basis of the CLIP and CoLP services and lays a foundation for providing new types of information services. The invention is suitable for use in connection with both terminals coupled to a wired network and portable terminals, such as mobile stations.

The invention is characterised in what has been said in the characterising parts of Claims 1, 7 and 8.

Figure 1 illustrates an example of a telecommunication system according to the invention and its structural parts,

Figure 2 illustrates, as a flowchart, the transmission of a service page, according to the invention, in an embodiment of the invention, wherein a subscriber B selects the desired service page,

Figure 3 illustrates how address information and identification information are included in a data packet,

Figure 4 illustrates an implementation of the implementation of a reference table, characteristic of the invention,

Figure 5 illustrates a data packet used for transmitting information in connection with the invention, and the information it contains,

Figure 6 illustrates an example of a service page that can be transmitted in a manner according to the invention,

Figures 7, 8 and 9 illustrate, as a block diagram, the transmission of a service page according to the invention in certain embodiments of the invention, and

Figure 10 illustrates a communicator according to the invention and its structural parts.

Figure 1 illustrates an example of a telecommunication system according to the present invention, wherein it is possible to transmit service pages, created and maintained in a telecommunication network, on to the display of terminals. The system comprises different kinds of terminals, such as mobile stations 10 and 11 that can be coupled to computers 20 and 21, traditional mobile stations 12, communicators 13, wired telephones 14 that can be coupled to a computer 22, as well as ordinary telephones 15. In addition to these, an ex-

tremely suitable terminal is a computer which is equipped, e.g., with a radio module, connected to the computer's PCMCIA (Personal Computer Memory Card International Association) bus, the radio module providing for a wireless communication connection to be established in telecommunication networks. Area 18, indicated by a dashed line, illustrates a telecommunication system within an office. In addition to the mobile stations 10 and 11, coupled to the computers 20 and 21, it comprises a local area network (LAN, Reference 26), as well as a server 23. The local area network 26 has been coupled to public telecommunication networks, such as an Internet network 120 by means of a router 27. Public Internet servers 24 are connected to the-Internet network 120. The Internet network 120 is in contact with a public telephone network (ISDN/PSTN, Reference 110) through a gateway server 25. From the gateway server 25, there is also a connection to a mobile services switching centre 100. Base station controllers 104 and base stations 105, known to a person skilled in the art, as well as other structural parts characteristic of a mobile network are in contact with the mobile services switching centre. In connection with the mobile services switching centre, there is also provided a separate database 101 for storing CLIP OR CoLP identifiers 53 and the corresponding URL addresses 54.

In the following, the transmission of a service page according to the present invention is described in detail with the help of a preferred example, wherein a receiving terminal retrieves through the Internet network, on the basis of the information transmitted by means of a CLIP service, additional information on a caller (subscriber A) and displays it on the display of a receiving terminal (subscriber B). If no additional information is available, the receiving terminal displays on its display the mere information transmitted by the CLIP service (i.e., the caller's telephone number) in a manner known to a person skilled in the art. In this example, the traditional mobile station 12 acts as the caller (subscriber A) and the telephone 14, which is in contact with the computer 22 and the telephone network 110, is the receiving terminal. Figure 2 illustrates, in the form of a block diagram, the procedure that has been presented in detail both above and in the following chapter.

When a call is made from the mobile station 12 (subscriber A 12), through the base station 105, the base station controller 104, the mobile services switching centre 100 and the telephone network 110, to the subscriber number (Phase 30, Figure 2) of the telephone 14 (subscriber B 14), the subscriber number (telephone number) of the mobile station 12 is transmitted as a CLIP service to the telephone 14 (Phase 31) in manner known to a person skilled in the art. If the telephone 14 is, e.g., an ISDN telephone equipped with a display, the telephone number of the mobile station 12 is normally displayed on a display 16 of the telephone 14. The communication system according to the invention preferably also provides an opportunity to present other information. In this embodiment of the invention, this is implemented so that the computer 22 has been coupled, by means of a cable 28, parallel to the telephone 14 and from the computer there is a connection to the Internet network 120. When the CLIP information arrives at the telephone 14, it is also simultaneously transmitted, through the cable 28, to the computer 22, e.g., through a commercially available ISDN card installed in the computer 22. The ISDN card, installed in the computer 22, identifies the subscriber identifier (telephone number) of the subscriber A 12 and stores it in its memory, whereto an application program, installed in the computer 22, can go and read it, e.g., through the computer's PCI (Peripheral Component Interconnect) or ISA (Industry Standard Architecture) bus. Alternatively, the ISDN card can transmit the subscriber identifier directly into the computer's memory through said buses and inform the application program by means of a message informing of the reception of the CLIP information. The application program can be implemented in a manner known to a person skilled in the art by utilising an application programming interface (API) supplied by the ISDN card manufacturer. The implementation of the application program is dependent on the structure of the ISDN cards and on the implementation of the different kinds of application programming interfaces provided by the card manufacturers. After having received the CLIP identifier of the subscriber A 12, the computer 22 contacts, through the Internet network 120, a reference server (Phase 32), in this case, e.g., the address server 24, by transmitting it a contact message 40 (Figure 3).

In the contact message 40 (Figure 3), the computer 22 includes, in addition to a URL (Uniform Resource Locater) address 41 of the address server 24, a CLIP identifier 42 of the subscriber A, which is thus transmitted to the address server 24 (Phase 33). The address server 24 comprises a reference database 50 (Figure 4), wherein a number of Internet addresses (URL1-URLN, Reference 54) corresponding to the CLIP identifiers (CLIP1-CLIPN, Reference 53) of different subscribers have been stored. This reference database 50 can be maintained, e.g., by some commercial service provider in contact with the telecommunication network 120, but the reference database can also be integrated with the mobile services switching centre 100 and/or the database 101 arranged in connection with it. When the address server 24 receives the contact message 40 from the computer 22, it goes to its reference database 50 to see whether the CLIP identifier 53, corresponding to the CLIP identifier 42 of the subscriber A in question, can be located (Phase 34). If the corresponding CLIP identifier 53 cannot be located in the reference database 50, then neither has the corresponding URL address 54 been linked with the CLIP identifier 42 in question. In that case, the address server 24 transmits to the computer 22 a response message 60 (Figure 5), wherein it informs that the URL address 54 corresponding to the CLIP identifier 42 cannot be located. The response mes-

sage 60 comprises a URL address 61 of the computer 22 on the basis of which the response message 60 is routed to the computer 22, as well as the CLIP identifier 42 of the subscriber A, a URL data field 63 and an additional data field 64. The CLIP identifier 42 of the subscriber A is placed in the response message 60 so that the computer 22 is able to distinguish between the possibly many response messages 60, relating to different calls. A negative search result is indicated, e.g., so that the URL data field 63 of the response message 60 is left empty. If the URL address 54 corresponding to the CLIP identifier 42 of the subscriber A was not located, the computer 22 displays on its display, if so required, a text which informs that no URL address (i.e., an Internet address, wherefrom the service page could be retrieved) corresponding to the caller (subscriber A 12) can be located (Phase 35). If the telephone 14 is equipped with the sufficiently large display 16, it is possible to transmit the information directly on to the display 16 of the telephone 14. After the optional message mentioned above (Phase 35), the CLIP identifier (telephone number) of the subscriber A is displayed as normal on the display 16 of the telephone 14 (Phase 36).

If a CLIP1 identifier 51, corresponding to the caller's CLIP identifier 42, is located in the reference database 50, the address server 24 places a URL1 address 52 corresponding to it in the URL data field 63 of the response message 60. After this, the address server 24 sends the response message 60 to the computer 22 (Phase 37). After having received the response message 60, the computer 22 retrieves on the basis of the URL address 63, through the Internet network 120, a service page 70 corresponding to the URL address 63 (Figure 6) from one of the servers 23, 24, 25 (Phase 38) connected to the network. The server can be the same as the reference server 24, but it can just as well be the subscriber A's own server located anywhere in the Internet network 120. The server 23, 24, 25 can also be a commercial service that can be purchased from teleoperators, whereupon the server is typically on the teleoperators' premises. After having retrieved the service page (e.g., the information page 70 implemented in the HTML page description language), the subscriber B 14 preferably displays it on the high-quality display of the computer 22 (Phase 39), but depending on the properties of the display 16 of the telephone 14, it can also be displayed on the display 16 instead of the telephone number (CLIP identifier 42). In this exemplary case, the service page 70 contains, among other things, address information 71 of the subscriber A 12, a greeting 72 and a picture 73 of the user of the telephone 12. In addition, the service page 70 may comprise, e.g., links 74 to other WWW pages, as well as audio and video shots. Since separate communication connections are used for switching the call and transmitting the service page 70 (telephone network 110 and Internet network 120), the transmission of the service page according to the present invention does not affect normal call set-up at all. The time consumed on transmitting the service page 70 from the server 23, 24, 25 that is in contact with the Internet network 120, depends only on the capacity of the Internet network 120 and different components 23, 24, 25, 26, 27 that are in contact with it.

The area 18, indicated by a dashed line in Figure 1, illustrates a communication system used within an office. The local are network 26 is used as its internal communication bus. The architecture of this system differs from the one presented above in that the computers 20 and 21 are equipped with the specified mobile stations 10 and 11 to be connected to the computers. The mobile stations 10 and 11 are equipped with means which also enable calls to be transmitted through the Internet network 120. Thus, no separate direct connection to the telephone network 110 is preferably required. The usefulness of transmitting the service page 70 by means of the identification services (e.g., the CLIP and CoLP services) of a line according to the present invention is illustrated below by way of another example, wherein said office is assumed to be a teleselling office. A common database for all the telesellers comprising, among other things, the customers' contact information, volume of orders in hand, invoicing and information on previous contacts has been stored in the company's own server 23. Communication from the computers 20 and 21 to the server 23 is managed using Internet protocol and the local area network 26, but since external servers (e.g., the computer 22) have limited access to the database mentioned above, the system is called an Intranet network.

When the mobile station 10, 11 is coupled to the computer 20, 21, the computer 20, 21 identifies the mobile station 10, 11 coupled thereto, e.g., on the basis of a telephone number stored in a SIM (Subscriber Identity Module) card used in the mobile station. After this, the computer 20, 21 sends, through the local area network 26, the router 27 and the Internet network 120, the information about the coupling to the server 25. The server 25 maintains a database of those mobile stations which are connected to the computers 20 and 21 and sends the information further to the mobile services switching centre 100 or correspondingly to the telephone exchange 110, e.g., as a call transfer. Thus, the mobile services switching centre 100, the telephone exchange 110 and the server 25 can route the incoming calls through the Internet network 120 to the mobile stations 10, 11 coupled to the computers 20, 21. When the mobile station 10, 11 is connected to the computer 20, 21, the traditional radio frequency components of the mobile station 10, 11 can be switched off. The mobile station 10, 11 operates unconnected, i.e., when it has not been coupled to the terminal 20, 21, just as the ordinary mobile station 12.

When the subscriber A, e.g., the mobile station 12, contacts the subscriber B, i.e., the mobile station 10 in this teleselling example, the CLIP information is transmitted from the mobile station 12 to the mobile station

10 through the mobile services switching centre 100, the server 25, the Internet network 120, the router 27, the local area network 26 and the computer 20. When perceiving the CLIP information 42 transmitted to the mobile station 10, a program installed in the computer 20 establishes a connection, through the local area network 26, to the office's own server 23 and retrieves therefrom the service page corresponding to the subscriber A 12 (containing the subscriber A's address information etc. as presented above), provided that it can be located in the file. In this respect, the activity corresponds to the principle described in connection with the embodiment presented above. Thus, the information retrieval procedure, implemented in this teleselling example on the basis of a CLIP identifier according to the present invention, provides for the customer data of a customer contacting by telephone to be updated on the screen of the computer 20 preferably without the user of the computer 20 being actively involved. The communication system according to the invention facilitates and speeds up the work of telesellers because, in the previous systems, it has been necessary to separately retrieve customer data from a database manually, e.g., on the basis of the caller's name.

In the two exemplary cases, presented above in detail, a wired communication connection was used to retrieve a service page from the Internet network 120 or from an intranet network (local area network 26). Advanced telecommunication terminals also provide an opportunity to utilise wirelessly the transmission of the service page 70, according to the present invention, on the basis of a CLIP or CoLP identifier. In the following, the present invention will be illustrated by way of example, wherein a telephone 15 is the subscriber A and the communicator 13 is the subscriber B. When a connection is established from the telephone 15 to the communicator 13 through the telephone network 110, the mobile services switching centre 100, the base station controller 104 and the base station 105, the CLIP identifier of the telephone 15 is transmitted to the communicator 13 in a known manner. On the basis of this information, the communicator 13 according to the present invention opens up a data connection through the mobile network 105, 104, 100 and the server 25 to the Internet network 120 and further, e.g., to the server 24, wherefrom it retrieves the service page addressed to the subscriber A (telephone 15) provided that it exists. In principle, the procedure is the same as in the two previous embodiments of the invention presented above. The structural parts of the communicator 13 according to the invention, i.e., a processor 131, a memory 132, radio parts 133, an antenna 134, a small display 135 and a keyboard 136 have been illustrated folded in Figure 10. The service page retrieval process is preferably implemented programmably in the processor 131 and the program code itself has been stored in the memory 132.

However, when using the wireless communication connection, presented in the previous chapter, we face a problem in the current mobile communication systems. In the GSM system, for example, there is only one traffic channel for transmitting speech and data. This prevents speech and data from being transmitted simultaneously from two different addresses 15, 24. The reason for this is that the call set up by the subscriber A 15 to the subscriber B 13 requires a traffic channel of its own in the same way as the data connection used for transmitting the service page 70 from the server 24 to the subscriber B 13.

What has been presented above will no longer be a problem in future mobile networks, which will provide for several different types of data to be transmitted simultaneously. An example of this is the GPRS (General Packet Radio Service), to be implemented on the GSM system, which provides a data transmission channel in the form of a packet that can be used at the same time as the normal traffic channel used for speech transmission. Thus, the service page transmission system according to the present invention is extremely suitable for use in connection with GPRS-type mobile networks, wherein normal speech communication is established using a normal GSM traffic channel and the service page is retrieved from the Internet network 120 using a GPRS data channel.

Alternatively, the problem presented above can be solved using a short message service (SMS), provided by the GSM system, for transmitting the service page 70. The short message service is a data channel originally designed for transmitting short messages consisting of a maximum of 160 ASCII characters, although the short message service is expected to be expanded. The expansion of the short message service will also provide for messages consisting of more than 160 characters to be transmitted by dividing the transferable data into several successive short messages. The short messages are transmitted in a signaling channel and, therefore, the use of the short message service does not restrict the use of the traffic channel for simultaneous speech communication.

It is also possible to implement the system for transmitting the service pages 70, according to the present invention, in the existing GSM networks without short messages by using supplementary services (SS) and unstructured supplementary service data (USSD), provided by the GSM system. In addition to the CLIP and CoLP services mentioned above these include, among other things, putting an answered call on hold and setting up a second connection. A prerequisite for the use of the supplementary services is that the terminal has certain intelligence, but preferably no changes have to made in the mobile network 100, 104, 105. In the following, an embodiment of the present invention is presented in detail by referring to Figure 7. In this embodiment, the communicator 13 retrieves the service page 70 wirelessly utilizing the supplementary services of a GSM network.

In Figure 7, the operation of the embodiment of the

invention, mentioned above, has been illustrated in the form of a flowchart. First, the subscriber A (telephone 15) calls the subscriber B, through the telephone network 110, the mobile services switching centre 100, the base station controller 104 and the base station 105, and the CLIP identifier 42 is transmitted to the subscriber B, i.e., to the communicator 13 (Phase 80). After having received the CLIP identifier, the communicator can retrieve the service page 70 in a number of ways. The CLIP service of the GSM system enables the subscriber A to be identified without the call being answered. Thus, it could be possible for the processor 131 of the communicator 13 to initiate the process of retrieving the service page 70 without answering the call coming from the subscriber A. However, because it is impossible to know the exact time consumed on the transmission of the service page 70, retrieved through the Internet network 120, it is better to answer the call and ask, e.g., by means of a message stored in the memory 132 of the communicator 13, the subscriber A 15 to hold on a moment without disconnecting the telephone 15. Naturally, this information could be transmitted orally, but one advantage of the invention is just the fact that the service page 70 can be transmitted automatically without the subscriber B being actively involved. In the embodiment illustrated in Figure 7, it is assumed that the communicator 13 answers the call automatically, transmits to the subscriber A the message telling to wait, stored in advance in the memory 131, and, after this, sets the call coming from the subscriber 15 on hold (Phase 81). Next, the communicator 13 sets up, through the radio parts 133 and the antenna 134, a data call to the server 24, which is in contact with the Internet network 120, through the mobile network 100, 104, 105 and the server 25 (Phase 82). After this, the server 24 goes through its reference table 50 to see whether the URL address 52, corresponding to the CLIP information 42 of the subscriber A, can be located (Phase 83). If a corresponding URL address cannot be located, the server 24 transmits to the communicator 13 the response message 60 informing of the negative search result. In that case, if so required, the communicator 13 displays on its display 17, e.g., a message "Service Page Unavailable", to the user (Phase 84). In the next phase, the communicator 13 disconnects the data call it has set up (Phase 85) and returns the call coming from the subscriber A 15 that has been put on hold, to an active state (Phase 87). But if the server 24 locates, in its reference database 50, the URL address 52 corresponding to the CLIP information 42 of the subscriber A 15, the server 24 transmits the URL address 52 to the communicator 13 included in the response message 60 informing of the positive search result (Phase 88). On the basis of the URL address 52 it has received, the communicator 13 makes contact, through the open data channel, with the server indicating the URL address 52 (e.g., the server 25 maintained by an operator) (Phase 89) and asks it to transmit the service page 70 corresponding to the subscriber A 15 (Phase 90). When the service page 70 has been received in full, the communicator 13 disconnects the data connection controlled by the processor 131 (Phase 91) and returns the call on hold to an active state (Phase 92). The service page 70, corresponding to the subscriber A, that has been retrieved through the Internet network 120 is displayed on the display 17 of the communicator 13 according to the present invention (Phase 93) instead of a mere telephone number provided by the CLIP service.

If the reference table 50 is located in the memory 132 of the communicator 13, instead of being in a telecommunication network server (such as the server 24 mentioned in the specification of Figure 7), the process presented above is simpler. The reason for this is that it is not necessary to first contact telecommunication network servers in order to find out the URL address of the service page 70 (Phase 82, Figure 7), but the possible URL address can be located directly in the memory 132 of the communicator 13. Thus, it is neither necessary to perform the activities illustrated in the phases 85, 86 and 88 of Figure 7, because the subscriber A is put on hold (Figure 8, Phase 81) only after the URL address has been retrieved from the memory 132 (Phase 94). Figure 8 illustrates this particular embodiment of the present invention. The phases 80, 81, 84, 87, 89, 90, 91, 92 and 93, common to Figures 7 and 8, have been illustrated using the same numbers. It is also possible to equip the memory 132 of the communicator 13 with a combination software enabling the service page 70 to be utilised irrespective of whether the reference table 50 is located in a telecommunication network server or in the actual terminal (communicator 13).

In the examples of the embodiments presented above, the service page 70 was always transmitted from a server chosen by the receiver (subscriber B). It is true that this is a natural course of action according to the nature of the transmission mechanism of CLIP information and that of call traffic, since it is always the receiver who also makes the final decision of whether he answers the incoming call at all. However, it is also possible to transmit the service page 70 on the basis of the CLIP information, according to the present invention, controlled by the subscriber A provided that the subscriber B allows this with his terminal. The practical implementation corresponds to what has been presented in connection with the specification of Figures 2-8 with the exception that the subscriber A has been provided with an opportunity to edit the reference database 50 (Figure 4). Thus, the subscriber A can specify the URL address 52 corresponding to this own CLIP identifier (e. g., CLIP1, Reference 51). Hence, when the subscriber A establishes a connection to the subscriber B, the service page selected by the subscriber A, e.g., a service price-list or some other commercial handout, is transmitted to the subscriber B.

The procedure presented above can also be utilised in connection with automatic telecommunication servic-

es. In the following, we will describe, as an exemplary embodiment, the transmission of tips for the pools and the results of ice-hockey matches from the server 25 (subscriber A) to the portable communicator 13 (subscriber B). The service page comprising the tips for the pools and the results of the matches has been implemented, e.g., in the HTML page description language as the service page 70 illustrated in Figure 6. In this example, the user of the communicator 13 has made a contract with a public telecommunications operator for the transmission of the tips for the pools and the results of the ice-hockey matches every time the data are updated. This has been implemented so that when the data of the service page change, the server 25 contacts the communicator 13 through the mobile network 100, 104, 105. The communicator 13 identifies, on the basis of the CLIP identifier it receives, that the teleservice presented above is being transmitted. The communicator 13 according to the present invention transmits to the user, controlled by the processor 131, a specific ringing tone to inform that the service has been activated and to distinguish the service from an ordinary incoming call. The program code, stored in the memory 132 of the communicator 13, can be set on automatic response, whereupon it is possible to utilize the service completely without the user being actively involved. After this, the communicator 13 retrieves, e.g., from the URL address, agreed upon when making the service contract and stored in the memory 132 of the communicator 13, the service page comprising the tips for the pools and the results of the matches by means of the service page transmission method according to the present invention and displays it on its display 17 (folded with the small display 135). Thus, the user of the communicator 13 always receives automatically the results of the matches in real-time. A similar type of service is also suitable for advertising purposes. In that case, a service provider can transmit, e.g., a price-list that is changed monthly to all prospective customers using a terminal capable of transmitting service pages on the basis of a CLIP identifier according to the present invention.

In the detailed specification of the present invention, we have described many different types of services that provide for the versatile service pages 70 to be transmitted to the subscriber B on the basis of the information transmitted by the CLIP service. By means of the service page transmission method according to the present invention, it is also possible to transmit the service pages 70 to the subscriber A on the basis of the CoLP service of the GSM system as already stated in the short summary of the invention. In this case, the implementation of the invention substantially complies with the solutions presented in connection with Figures 2-8. Figure 9 illustrates, in the form of a flowchart, the transmission of a service page, linked with the subscriber B, to the subscriber A on the basis of the CoLP information. The flowchart, illustrated in Figure 9, can be applied to the third and fourth embodiments of the present invention presented in the short summary of the invention.

This paper presents the implementation and embodiments of the present invention with the help of examples. It is obvious to a person skilled in the art that the present invention is not restricted to details of the embodiments presented above, and that the invention can also be implemented in another form without deviating from the characteristics of the invention. The embodiments presented should be considered illustrative, but not restricting. Thus, the possibilities of implementing and using the invention are only restricted by the enclosed claims. Consequently, the various options of implementing the invention as determined by the claims, including the equivalent implementations, also belong to the scope of the invention.

Claims

1. An information transmission system comprising a first terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), a second terminal (10, 11, 12, 13, 14, 15, 20, 21, 22) and means (26, 100, 104, 105, 110, 120, 133, 134) for setting up a communication connection between said first terminal (10, 11, 12, 13, 14, 15, 20, 21, 22) and said second terminal (10, 11, 12, 13, 14, 15, 20, 21, 22) and that said communication connection set-up means (26, 100, 104, 105, 110, 120, 133, 134) have been arranged to transmit a telephone network subscriber identifier (42, 51, 53), characteristic of said first terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), to said second terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), **characterised** in that, in addition, it comprises a server (20, 21, 22, 24, 25) connected to said communication connection (26, 100, 104, 105, 110, 120, 133, 134) for storing and further transmitting service pages (70) and that said communication connection set-up means (26, 100, 104, 105, 110, 120, 133, 134) have been arranged to transmit, on the basis of said telephone network subscriber identifier (42, 51, 53), a specified service page (70) to one of the following terminals: said first terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), said second terminal (10, 11, 12, 13, 14, 15, 20, 21, 22) and both terminals (10, 11, 12, 13, 14, 15, 20, 21, 22).

2. An information transmission system according to claim 1, **characterised** in that said telephone network subscriber identifier (42, 51, 53) is one of the following: CLIP (Calling Line Identification Presentation) information and CoLP (Connected Line Identification Presentation) information.

3. An information transmission system according to claim 1 or 2, **characterised** in that, in addition, it comprises a reference database (50) for storing the telephone network subscriber identifier (42, 51, 53),

characteristic of said first terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), and address information (41, 52, 54) of said server (20, 21, 22, 24, 25) and that said reference database (50) is located in one of the following parts of the information transmission system: said first terminal (10, 11, 12, 13, 14, 15, 20, 21, 22) and said server (20, 21, 22, 24, 25).

4. An information transmission system according to claim 3, **characterised** in that, in addition, it comprises a mobile services switching centre (100) and storage means (101, 53, 54) and that said reference database (50) is located in said storage means (101, 53, 54).

5. An information transmission system according to claim 3 or 4, **characterised** in that said communication connection set-up means (26, 100, 104, 105, 110, 120, 133, 134) have been arranged to transmit said service page (70) from an address specified by said address information (41, 52, 54) stored in said reference database (50).

6. An information transmission system according to claim 4 or 5, **characterised** in that it comprises means for editing said reference database (50) and for rendering the editing rights and that one of the following has been arranged to edit said reference database (50): said first terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), said second terminal (10, 11, 12, 13, 14, 15, 20, 21, 22) and said server (20, 21, 22, 24, 25).

7. A terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), which comprises means (131, 132, 133, 134) for setting up a connection and for transmitting information between a telecommunication network (26, 100, 104, 105, 110, 120) and said terminal (10, 11, 12, 13, 14, 15, 20, 21, 22) and means (131, 132, 133, 134) for receiving a telephone network subscriber identifier (42, 51, 53) from said telecommunication network (26, 100, 104, 105, 110, 120), **characterised** in that it comprises means (131, 132, 133, 134) for retrieving a service page (70) from said telecommunication network (26, 100, 104, 105, 110, 120) as a response to a telephone network subscriber identifier (42, 51, 53) it has received.

8. A method for transmitting information, wherein

- a communication connection (26, 100, 104, 105, 110, 120) is set up between two terminals, a first terminal (10, 11, 12, 13, 14, 15, 20, 21, 22) and a second terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), and
- a telephone network subscriber identifier (42, 51, 53), characteristic of said first terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), is transmitted to said second terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), **characterised** in that
- a specified service page (70) is transmitted on the basis of said telephone network subscriber identifier (42, 51, 53) to one of the following terminals: said first terminal (10, 11, 12, 13, 14, 15, 20, 21, 22), said second terminal (10, 11, 12, 13, 14, 15, 20, 21, 22) and both terminals (10, 11, 12, 13, 14, 15, 20, 21, 22).

9. A method for transmitting information according to claim 8, **characterised** in that said telephone network subscriber identifier (42, 51, 53) is one of the following: CLIP (Calling Line Identification Presentation) information and CoLP (Connected Line Identification Presentation) information.

10. A method for transmitting information according to claim 8 or 9, **characterised** in that said service page (70) is transmitted on the basis of telephone network subscriber identifiers (42, 51, 53) and address data (41, 52, 54) stored in a separate reference database (50).

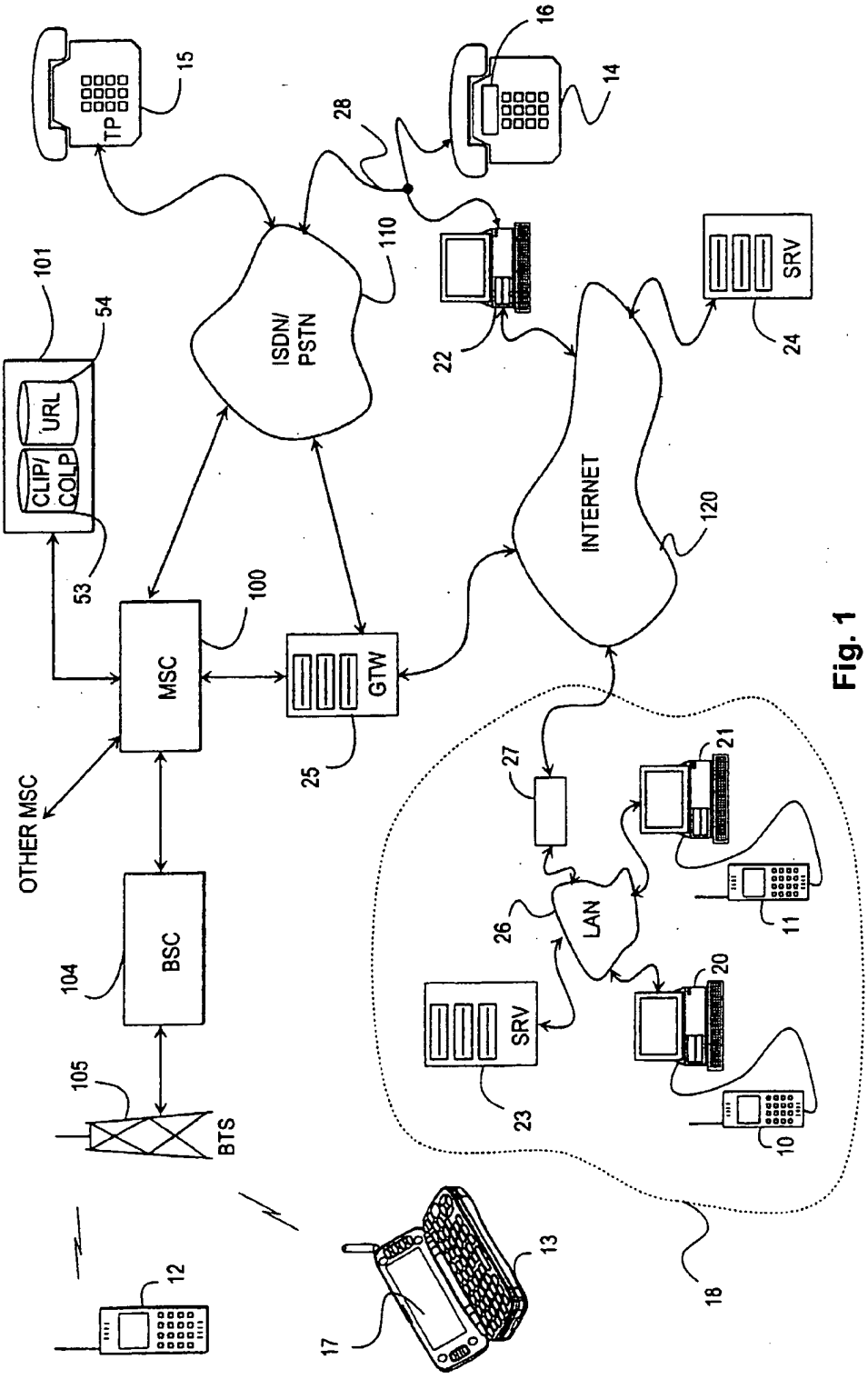
TP
15
16
14
28
ISDN/
PSTN
110
101
54
URL
CLIP/
COLP
53
22
SRV
24
INTERNET
120
MSC
100
GTW
25
OTHER MSC
27
21
LAN
26
11
20
SRV
23
10
BSC
104
105
BTS
12
13
17
18

Fig. 1

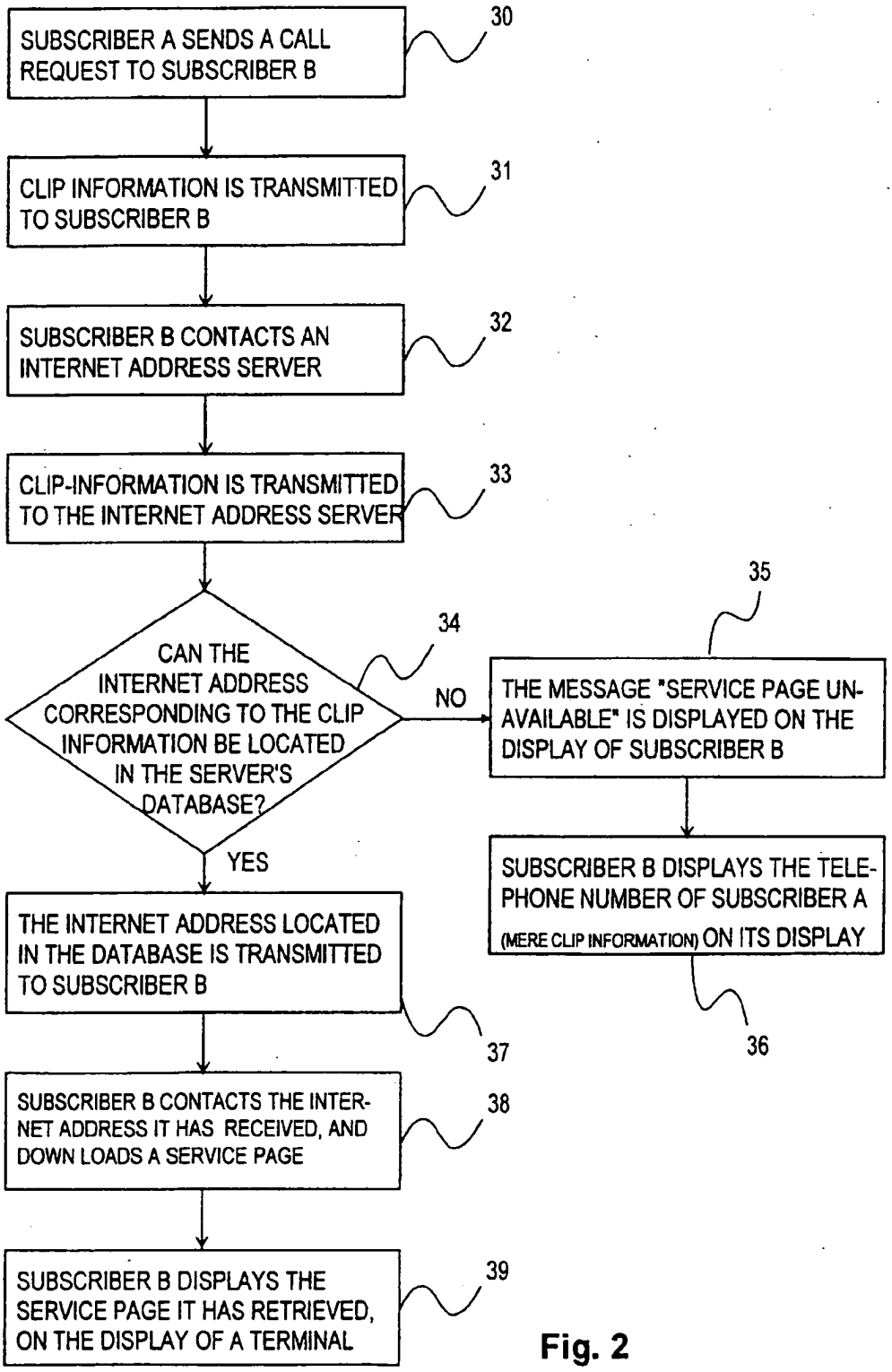
SUBSCRIBER A SENDS A CALL REQUEST TO SUBSCRIBER B
30
CLIP INFORMATION IS TRANSMITTED TO SUBSCRIBER B
31
SUBSCRIBER B CONTACTS AN INTERNET ADDRESS SERVER
32
CLIP-INFORMATION IS TRANSMITTED TO THE INTERNET ADDRESS SERVER
33
CAN THE INTERNET ADDRESS CORRESPONDING TO THE CLIP INFORMATION BE LOCATED IN THE SERVER'S DATABASE?
34
NO
YES
35
THE MESSAGE "SERVICE PAGE UNAVAILABLE" IS DISPLAYED ON THE DISPLAY OF SUBSCRIBER B
SUBSCRIBER B DISPLAYS THE TELEPHONE NUMBER OF SUBSCRIBER A (MERE CLIP INFORMATION) ON ITS DISPLAY
36
THE INTERNET ADDRESS LOCATED IN THE DATABASE IS TRANSMITTED TO SUBSCRIBER B
37
SUBSCRIBER B CONTACTS THE INTERNET ADDRESS IT HAS RECEIVED, AND DOWN LOADS A SERVICE PAGE
38
SUBSCRIBER B DISPLAYS THE SERVICE PAGE IT HAS RETRIEVED, ON THE DISPLAY OF A TERMINAL
39

Fig. 2

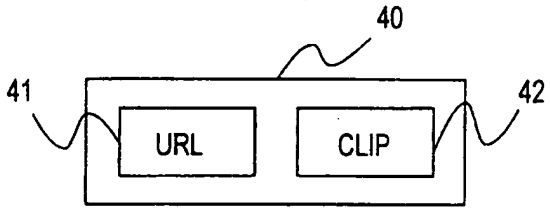

Fig. 3

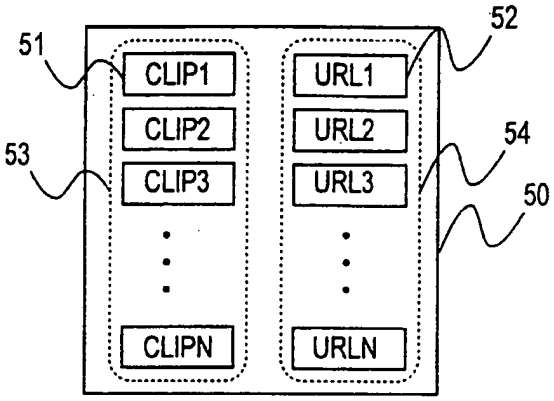

Fig. 4

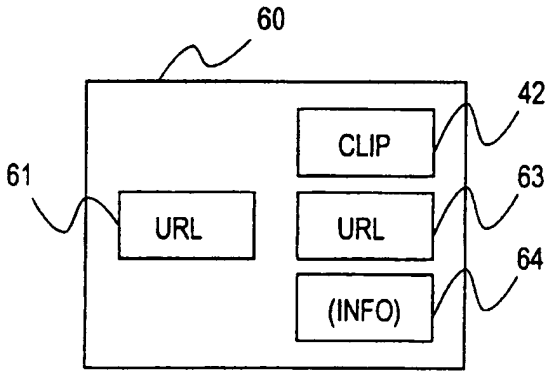

Fig. 5

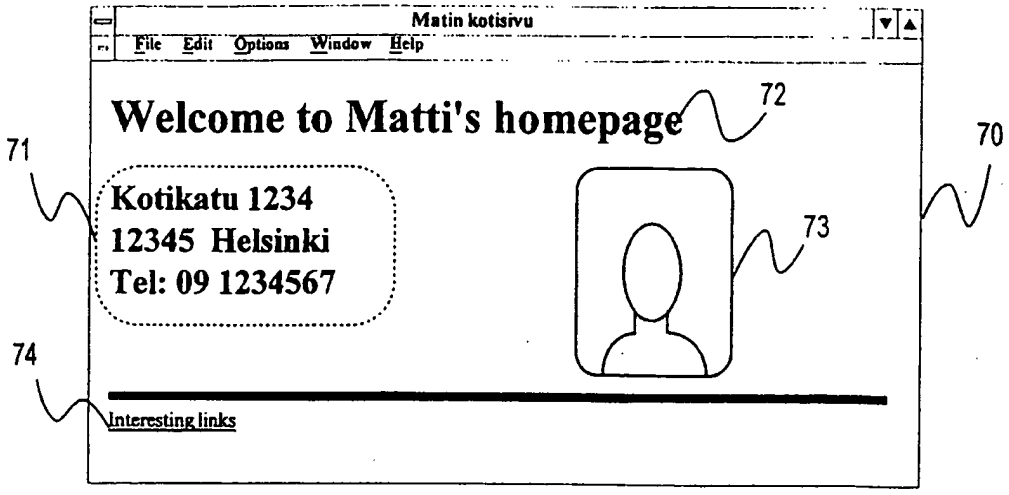
Matin kotisivu
File Edit Options Window Help
Welcome to Matti's homepage
72
70
71
Kotikatu 1234
12345 Helsinki
Tel: 09 1234567
73
74
Interesting links

Fig. 6

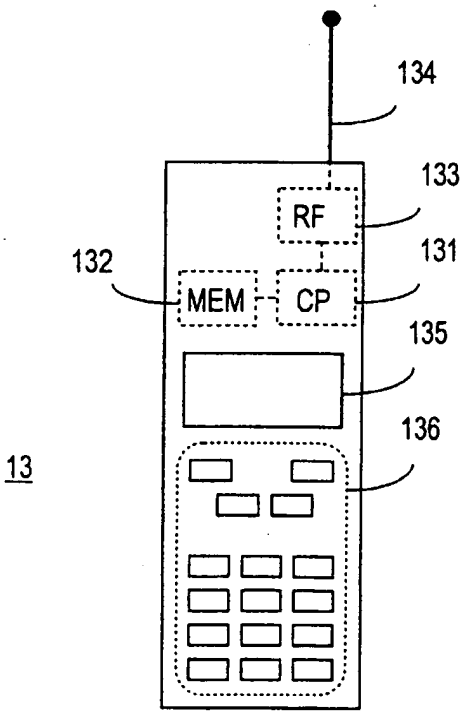
134
133
RF
131
132
MEM
CP
135
136
13

Fig. 10

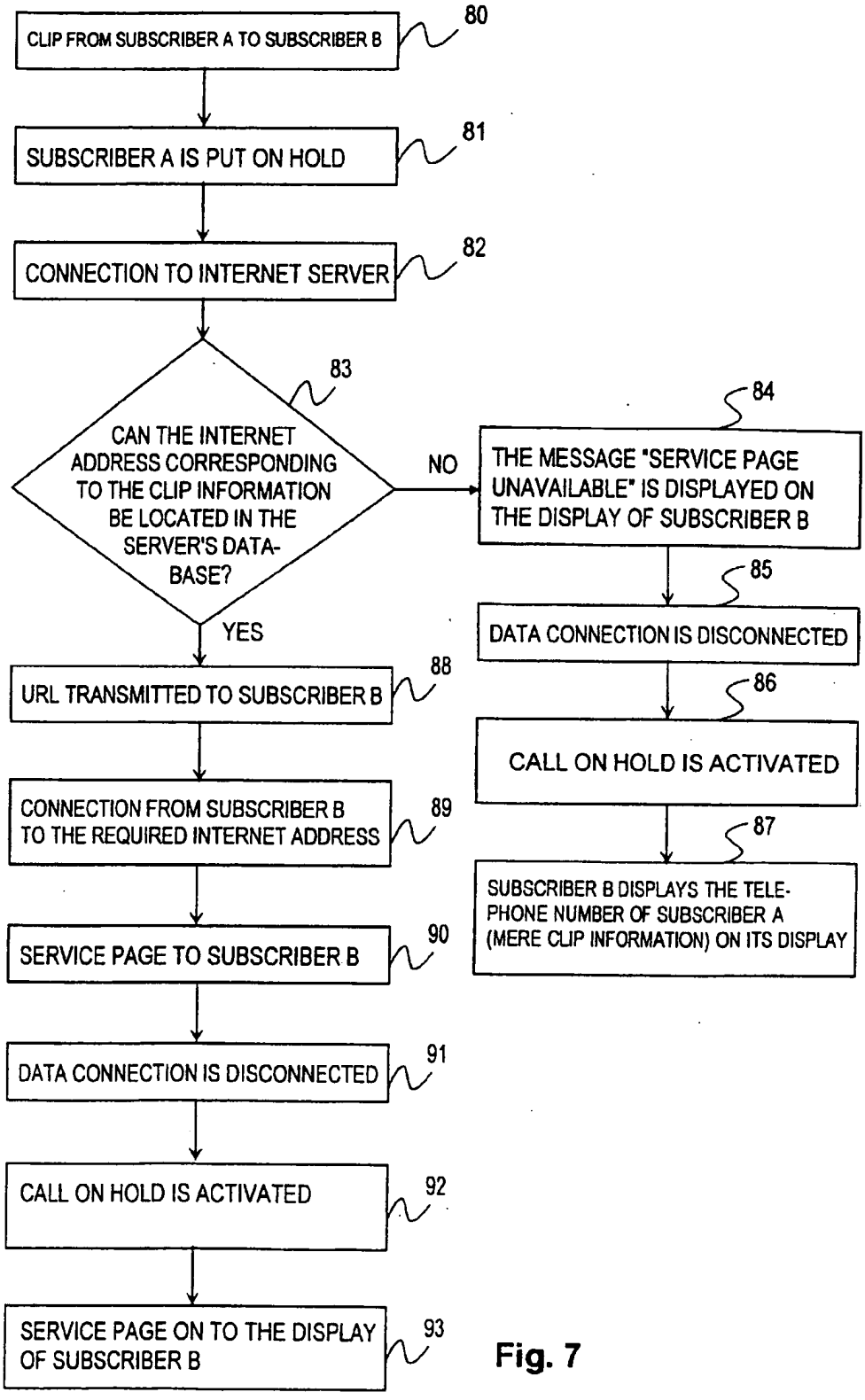
CLIP FROM SUBSCRIBER A TO SUBSCRIBER B
80
SUBSCRIBER A IS PUT ON HOLD
81
CONNECTION TO INTERNET SERVER
82
CAN THE INTERNET ADDRESS CORRESPONDING TO THE CLIP INFORMATION BE LOCATED IN THE SERVER'S DATA-BASE?
83
NO
THE MESSAGE "SERVICE PAGE UNAVAILABLE" IS DISPLAYED ON THE DISPLAY OF SUBSCRIBER B
84
DATA CONNECTION IS DISCONNECTED
85
CALL ON HOLD IS ACTIVATED
86
SUBSCRIBER B DISPLAYS THE TELE-PHONE NUMBER OF SUBSCRIBER A (MERE CLIP INFORMATION) ON ITS DISPLAY
87
YES
URL TRANSMITTED TO SUBSCRIBER B
88
CONNECTION FROM SUBSCRIBER B TO THE REQUIRED INTERNET ADDRESS
89
SERVICE PAGE TO SUBSCRIBER B
90
DATA CONNECTION IS DISCONNECTED
91
CALL ON HOLD IS ACTIVATED
92
SERVICE PAGE ON TO THE DISPLAY OF SUBSCRIBER B
93

Fig. 7

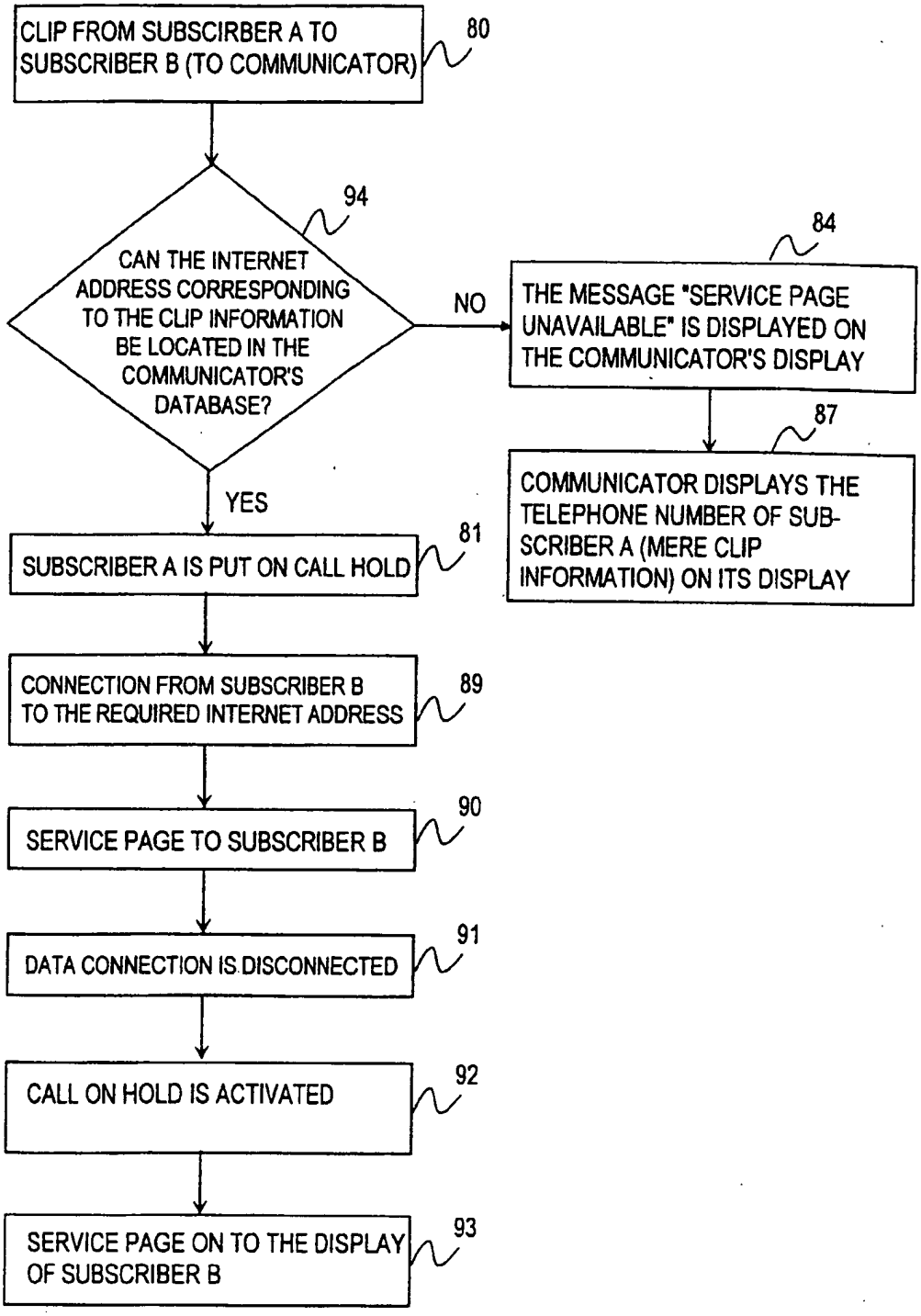
CLIP FROM SUBSCIRBER A TO SUBSCRIBER B (TO COMMUNICATOR)
80
94
CAN THE INTERNET ADDRESS CORRESPONDING TO THE CLIP INFORMATION BE LOCATED IN THE COMMUNICATOR'S DATABASE?
NO
84
THE MESSAGE "SERVICE PAGE UNAVAILABLE" IS DISPLAYED ON THE COMMUNICATOR'S DISPLAY
87
COMMUNICATOR DISPLAYS THE TELEPHONE NUMBER OF SUB-SCRIBER A (MERE CLIP INFORMATION) ON ITS DISPLAY
YES
SUBSCRIBER A IS PUT ON CALL HOLD
81
CONNECTION FROM SUBSCRIBER B TO THE REQUIRED INTERNET ADDRESS
89
SERVICE PAGE TO SUBSCRIBER B
90
DATA CONNECTION IS DISCONNECTED
91
CALL ON HOLD IS ACTIVATED
92
SERVICE PAGE ON TO THE DISPLAY OF SUBSCRIBER B
93

Fig. 8

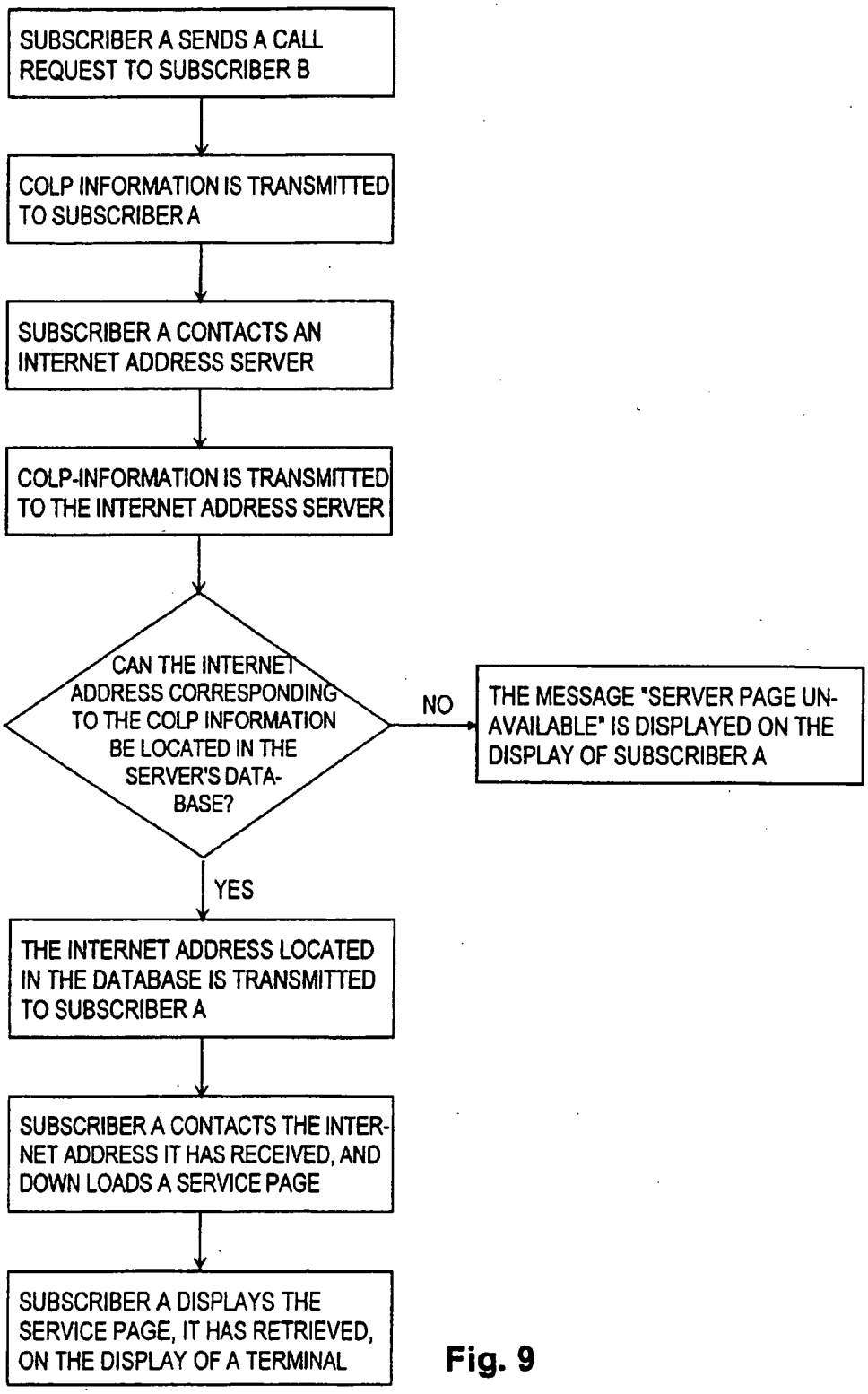
SUBSCRIBER A SENDS A CALL REQUEST TO SUBSCRIBER B
COLP INFORMATION IS TRANSMITTED TO SUBSCRIBER A
SUBSCRIBER A CONTACTS AN INTERNET ADDRESS SERVER
COLP-INFORMATION IS TRANSMITTED TO THE INTERNET ADDRESS SERVER
CAN THE INTERNET ADDRESS CORRESPONDING TO THE COLP INFORMATION BE LOCATED IN THE SERVER'S DATA-BASE?
NO
THE MESSAGE "SERVER PAGE UN-AVAILABLE" IS DISPLAYED ON THE DISPLAY OF SUBSCRIBER A
YES
THE INTERNET ADDRESS LOCATED IN THE DATABASE IS TRANSMITTED TO SUBSCRIBER A
SUBSCRIBER A CONTACTS THE INTER-NET ADDRESS IT HAS RECEIVED, AND DOWN LOADS A SERVICE PAGE
SUBSCRIBER A DISPLAYS THE SERVICE PAGE, IT HAS RETRIEVED, ON THE DISPLAY OF A TERMINAL

Fig. 9

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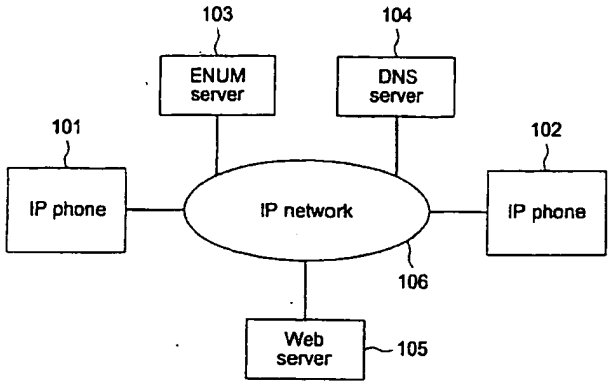
(54) **IP telephone system, IP telephone apparatus and communication method**

(57) An IP telephone system includes a source IP telephone apparatus, a Web server and an ENUM (tElephone NUmber Mapping) server. The source IP telephone apparatus is connected to an IP network. The Web server stores predetermined information regarding a user of the source IP telephone apparatus and transmits, to a destination IP telephone apparatus, the predetermined information in response to a request from the destination IP telephone apparatus. The ENUM server stores a NAPTR resource record which includes a URI utilized for obtaining the predetermined information stored in the Web server. In the IP telephone system, the destination IP telephone apparatus transmits, to the ENUM server, a request for a NAPTR resource record of the source IP telephone apparatus and transmits, to the Web server, a request for the predetermined information regarding the source IP telephone apparatus according to the obtained NAPTR resource record.

Fig.1



EP 1 619 866 A2

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an IP telephone system, an IP telephone apparatus and a communications method that perform voice communication via an IP network.

2. Description of Related Art

[0002] The recent rapid growth of the Internet has drawn attention to an IP telephone system that enables low-cost voice communications with telephone apparatuses at remote places as well as free voice communications between IP telephone apparatuses owned by subscribers. However, dishonest telemarketing agencies have been taking advantage of IP telephone systems using such low-cost or free communication services, causing a social problem.

[0003] Such unsolicited telemarketing calls may be blocked by using a caller identification function. For example, one possible countermeasure is to display, at a destination telephone apparatus, a telephone number of a source telephone apparatus, the telephone number of a source telephone apparatus being specified in header "From" in the "INVITE" message transmitted according to the SIP protocol. The SIP is a common call control protocol utilized in the IP telephone systems. This method allows users to screen out telephone calls from unidentified callers.

[0004] On the other hand, as an underlying technology, ENUM is emerging as the focus of attention. ENUM enables communications according to users' individual circumstances by effectively managing information used for diverse communications tools, including telephones, facsimiles, cellular phones and electronic mail. ENUM is designed to identify the Internet service with a unique global identification number such as the E.164 number, using the DNS (Domain Name System). Currently, the IETF (Internet Engineering Task force) is seeking to standardize ENUM platforms, where protocol specifications are discussed (See Publication 1, for example).

[Publication 1] Issued by ENUM Trial Japan "ENUM Trial Japan First Report" May, 2004

[0005] When using the above-described measure, however, it is necessary to ignore all calls from unidentified callers in order to avoid telemarketing calls. This results in a situation where communication cannot be established with any party who has called for the first time. As a result, a situation occurs where no communication can be established with parties that needed to be contacted, thus leading to the problem of no communication being allowed through such a telephone system.

SUMMARY OF THE INVENTION

[0006] The present invention is provided to address the above-described problems. The purpose of the present invention is to provide an IP telephone system, an IP telephone apparatus and a communications method that allow users to communicate safely with intentionally unblocked parties who have called for the first time while blocking unsolicited telemarketing calls, and that provide data to identify callers more easily than by checking callers' telephone numbers.

[0007] The present invention relates to an IP telephone system, an IP telephone apparatus, and an ENUM server. The IP telephone apparatus is connected to the IP network. The database server stores predetermined information regarding a user of a source IP telephone apparatus and transmits, to a destination IP telephone apparatus, the predetermined information in response to a request from the destination IP telephone apparatus. The ENUM server stores a NAPTR resource record which includes a URI utilized for obtaining the predetermined information stored in the database server. The ENUM server also transmits, to the destination IP telephone apparatus, a corresponding NAPTR resource record in response to a query from the destination IP telephone apparatus. In the IP telephone system, the IP telephone apparatus that received a call transmits, to the ENUM server, a query for a NAPTR resource record of the source IP telephone apparatus. The destination IP telephone apparatus transmits, to the database server, a request for the predetermined information regarding the user of the source IP telephone apparatus according to the obtained NAPTR resource record.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The present invention is further described in the detailed description which follows, with reference to the noted plurality of drawings by way of non-limiting examples of exemplary embodiments of the present invention, in which like reference numerals represent similar parts throughout the several views of the drawings, and wherein:

Fig. 1 illustrates a network configuration to which an IP telephone system according to the first embodiment of the present invention is applied;

Fig. 2 illustrates a block diagram describing a configuration of an IP telephone apparatus that constitutes the IP telephone system according to the first embodiment;

Fig. 3 illustrates the external front view of the IP telephone apparatus according to the first embodiment;

Fig. 4 illustrates a block diagram describing a typical configuration of an ENUM server in the IP telephone system according to the first embodiment;

Fig. 5 illustrates an example of a NAPTR record

stored in a DB of the ENUM server according to the first embodiment;

Fig. 6 illustrates an example of data stored in a DB of a DNS server according to the first embodiment;

Fig. 7 illustrates an example of data stored in a Web server according to the first embodiment;

Fig. 8 illustrates a sequence diagram describing operations until a source IP telephone apparatus performs voice communication with a destination IP telephone apparatus in the IP telephone system according to the first embodiment;

Fig. 9 illustrates an example of the "INVITE" message transmitted from the source IP telephone apparatus to the destination IP telephone apparatus in the IP telephone system according to the first embodiment;

Fig. 10 illustrates a flow chart describing an operation of the destination IP telephone apparatus in the Fig. 8 sequence;

Fig. 11 illustrates an example of a NAPTR record stored in a DB of an ENUM server according to the second embodiment;

Fig. 12 illustrates a sequence diagram describing operations until a source IP telephone apparatus performs voice communication with a destination IP telephone apparatus in the IP telephone system according to the second embodiment;

Fig. 13 illustrates a sequence diagram describing operations until a source IP telephone apparatus performs voice communication with a destination IP telephone apparatus in the IP telephone system according to the third embodiment; and

Fig. 14 illustrates a flow chart describing an operation of the destination IP telephone apparatus in the Fig. 13 sequence.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0009] The embodiments of the present invention are explained in the following, in reference to the above-described drawings.

First Embodiment

[0010] Fig. 1 illustrates a network configuration to which an IP telephone system according to the first embodiment of the present invention is applied.

[0011] As shown in the figure, in the IP telephone system according to the present embodiment, a plurality of IP telephone apparatuses (hereafter referred to as "IP phone") 101, 102, ENUM server 103, DNS server 104 and Web server 105 as a database server are mutually connected via IP network 106. The IP telephone system is not limited to the embodiment shown in the figure and may be configured to connect three or more IP phones on IP network 106.

[0012] IP phone 101 (102) has a function enabling voice communication with another IP phone via IP network 106. IP phone 101 (102) also has a browsing function allowing users to access Web server 105 according to an http protocol and to read HTML texts provided by Web server 105.

[0013] ENUM server 103 is equipped with a database (DB) that stores a NAPTR resource record (hereafter referred to as "NAPTR record"), which is described later. ENUM server 103 transmits, to IP phone 101 (102), a NAPTR record stored in the DB in response to a query from IP phone 101 (102).

[0014] DNS server 104 is equipped with a DB that stores a URI specified in a NAPTR record and an IP address corresponding to the URI. DNS server 104 transmits, to IP phone 101 (102), an IP address registered in the DB in response to a query from IP phone 101 (102).

[0015] Web server 105 is equipped with a DB that stores data to identify a caller of IP phone 101 (102), which is connected to IP network 106 (hereafter referred to as "caller information"). Caller information includes a telephone number (hereafter referred to as "caller number"), a name, an address, an email address and image data such as a photo of the caller's face. Caller information is not limited to individual information and may include a company's name, a telephone number, an address, an email address and an advertisement. Web server 105 transmits, to IP phone 101 (102), caller information stored in the DB in response to a request from IP phone 101 (102) that has received a call.

[0016] Fig. 2 illustrates a block diagram describing a configuration of IP phone 101 according to the present embodiment. IP phone 102 has the same configuration as IP phone 101.

[0017] According to IP phone 101 shown in the figure, IP phone controller 201 controls all operations needed to perform voice communication via IP network 106. For example, IP phone controller 201 executes a call control with the destination terminal according to call control protocols such as a SIP or an H.323. IP phone controller 201 also provides necessary instructions to query/response processor 202 or http client unit 203 (described later).

[0018] Query/response processor 202 is used to transmit, to ENUM server 103, a query for a NAPTR record corresponding to the destination terminal (hereafter referred to as "ENUM query") and receive a response to the ENUM query (hereafter referred to as "ENUM response"). Query/response processor 202 is also used to transmit, to DNS server 103, a query for an IP address (hereafter referred to as "IP address query") and to control the reception of a response to the IP address query (hereafter referred to as "IP address response").

[0019] Http client unit 203 controls access to Web server 105 and a reading of HTML texts provided by Web server 105. Http client unit 203 also controls a display of HTML texts downloaded from Web server 105 on display 204.

[0020] Display 204 is configured with an LCD and the

like. Display 204 displays the current status of IP phone 101 and displays input telephone numbers or other data. Display 204 also displays HTML texts downloaded from Web server 105 under the control of http client unit 203.

[0021] Fig. 3 illustrates the external front view of IP phone 101 according to the present embodiment. IP phone 102 has the same configuration as IP phone 101.

[0022] As shown in the figure, IP phone 101 is configured with receiver 301 that receives an operator's voice. IP phone 101 is also configured with numerical keys 302 that input telephone numbers or the like. IP phone 101 further includes, to the right side of numerical keys 302, AM (Answering Machine) button 303 and speaker button 304. AM button 303 is used to switch to the answering machine mode. Speaker button 304 is used to switch the mode to the external output voice. Function button 305 is located above numerical keys 302 and be able to set various functions such as a single touch transmission. IP phone 101 further includes, on its side, interface (LAN I/F) 306 to LAN which connects to IP network 106.

[0023] Display 204 is located above function button and be configured with an LCD or the like. Display 204 is used to display caller information (caller number or name) downloaded from Web server 105. Such display on display 204 is controlled in a process which is described later.

[0024] Fig. 4 illustrates a block diagram describing a typical configuration of ENUM server 103 in the IP telephone system according to the present embodiment. DNS server 104 and Web server 105 in the IP telephone system according to the present embodiment have the same configuration as ENUM server 103 except they have different data stored in their DBs.

[0025] As shown in the figure, ENUM server 103 includes CPU 401 that controls the entire operation of the server. Memory 402 is connected to CPU 401. Memory 402 has ROM and RAM functions. The ROM stores such programs as a control program for ENUM server 103, which is retrieved and executed by CPU 401. The RAM functions as a work memory when CPU 401 executes the control program.

[0026] Database (DB) 403 is connected to CPU 401. DB 403 stores a NAPTR record, which is described later. Upon receiving an ENUM query from IP phone 101, for example, CPU 401 searches for a NAPTR record corresponding to the ENUM query from the data stored in DB 403. CPU 401 then transmits the corresponding NAPTR record to IP phone 101 that has transmitted the ENUM query.

[0027] Furthermore, input/output device 404 is connected to CPU 401. Input/output device 404 is configured with an input device such as a keyboard and an output device such as a display. The input device is used, for example, to add and edit the data stored in DB 403. The output device is used for administrators of ENUM server 103 to confirm the data stored in DB 403.

[0028] Furthermore, Network Interface (I/F) 405 is connected to CPU 401. Network I/F 405 is an interface to IP network 106 to which ENUM server 103 is connected.

[0029] Fig. 5 illustrates an example of a NAPTR record stored in DB 403 of ENUM server 103 according to the present embodiment. The figure shows a case where DB 403 stores NAPTR records corresponding to domain names obtained from telephone numbers "0310000000" and "0310000001 ".

[0030] In the figure, URIs "81310000000@tokyo.sip.jp" and "//www.tokyo.sip.com/user81310000000.html" correspond to domain name "0.0.0.0.0.0.0.1.3.1.8.e164.arpa" obtained from telephone number "0310000000". The service field of the first URI specifies "E2U+sip", which indicates that the terminal specified by "0310000000" is able to perform the SIP protocol. The service field of the second URI specifies "E2U+http", which indicates that the terminal specified by "0310000000" is able to perform the http protocol.

[0031] URIs "81310000001@tokyo.sip.jp" and "//www.tokyo.sip.com/user81310000001.html" correspond to domain name "1.0.0.0.0.0.0.1.3.1.8.e164.arpa" obtained from telephone number "0310000001". The service field of the first URI specifies "E2U+sip", which indicates that the terminal specified by "0310000001" is able to perform the SIP protocol. The service field of the second URI specifies "E2U+http", which indicates that the terminal specified by "0310000001" is able to perform the http protocol.

[0032] Fig. 6 illustrates an example of data stored in a DB of DNS server 104 according to the present embodiment.

[0033] The figure shows a case where the DB of DNS server 104 stores URIs "81310000000@tokyo.sip.jp", "81310000001@tokyo.sip.jp", "81310000002@tokyo.sip.jp" and "81310000003@tokyo.sip.jp". More specifically, IP addresses "192.168.1.1", "192.168.1.2", "192.168.1.3" and "192.168.1.4" correspond to URIs "81310000000@tokyo.sip.jp", "81310000001 @tokyo.sip.jp", "81310000002@tokyo.sip.jp" and "81310000003@tokyo.sip.jp" respectively.

[0034] Fig. 7 illustrates an example of data stored in Web server 105 according to the present embodiment.

[0035] Fig. 7 shows a case where Web server 105 stores "//www.tokyo.sip.com/user8131 0000000.html" and "//www.tokyo.sip.com/user81310000001.html". More specifically, URIs (URLs) "//www.tokyo.sip.com/user81310000000.htm1" and "//www.tokyo.sip.com/user81310000001.html" contain data such as the names, telephone numbers, addresses and image data of "Matsushita Tarou" and "Matsushita Hanako".

[0036] The following describes the operations until IP phone 101 performs voice communication with IP phone 102 in the IP telephone system according to the present embodiment with reference to the Fig. 8 sequence diagram.

[0037] In this illustration, DB 403 of ENUM server 103 stores the NAPTR record shown in Fig. 5. The DB of DNS

server 104 stores the data shown in Fig. 6. Web server 105 stores the data shown in Fig. 7. IP phones 101 and 102 have "0310000000" and "0310000001" as respective assigned telephone numbers. The operators of IP phones 101 and 102 are "Matsushita Tarou" and "Matsushita Hanako" respectively.

[0038] When IP phone 101 performs voice communication with IP phone 102, the operator (Matsushita Tarou) of IP phone 101 first inputs the telephone number of IP phone 102 and instructs to transmit the ENUM query. In this case, telephone number "0310000001" is input, after which a instruction for transmitting the ENUM query is made.

[0039] Upon receiving the telephone number and then the instruction for transmitting ENUM query, IP phone 101 transmits, to ENUM server 103, an ENUM query for a NAPTR record corresponding to the telephone number (ST 801). In this case, IP phone 101 first converts the operator's input telephone number "0310000001" into "+81-3-10000001" including the country code according to standard E. 164. Then, "+81310000001" is obtained, maintaining + at the beginning and the numbers. Then, non numerical symbols are deleted, and dots are inserted between the numbers, resulting in "8.1.3.1.0.0.0. 0.0.0.1". Next, the numbers are reversed, and data string "e164.arpa" is added at the end. As a result, domain name "1.0.0.0.0.0.0.1.3.1.8. e164.arpa" is obtained. IP phone 101 then transmits, to ENUM server 103, the ENUM query for a NAPTR record corresponding to the domain name.

[0040] Upon receiving the ENUM query, ENUM server 103 searches for a NAPTR record corresponding to domain name "1.0.0.0.0.0.0.1.3.1.8. e 164.arpa" and transmits, to IP phone 101, an ENUM response including the corresponding NAPTR record (ST 802). In this case, ENUM server 103 retrieves the bottom NAPTR record among the NAPTR records shown in Fig. 5 and transmits, to IP phone 101, the ENUM response including the NAPTR record. When the ENUM response is transmitted to IP phone 101, IP phone 101 is notified that IP phone 102 is able to perform the SIP protocol and the http protocol.

[0041] When IP phone 101 receives the ENUM response including the NAPTR record, IP phone 101 transmits, to DNS server 104, a query for an IP address corresponding to URI "81310000001 @tokyo.sip.jp" specified in the NAPTR record, which indicates that the destination terminal is able to perform the SIP protocol (ST 803).

[0042] Upon receiving the IP address query, DNS server 104 searches for an IP address corresponding to the URI. DNS server 104 then transmits, to IP phone 101, an IP address response including the corresponding IP address (ST 804). In this case, DNS server 104 retrieves the second top IP address (192.168.1.2) among the IP addresses shown in Fig. 6 and transmits, to IP phone 101, the IP address response including the IP address.

[0043] Upon receiving the IP address response, IP phone 101 confirms the IP address assigned to IP phone 102. IP phone 101 then transmits the "INVITE" message to the IP address destination (ST 805).

[0044] The following describes an example of the "INVITE" message transmitted from IP phone 101 to IP phone 102.

[0045] Fig. 9 illustrates an example of the "INVITE" message transmitted from IP phone 101 to IP phone 102.

[0046] The "INVITE" message shown in the figure includes header "From" in the third line and header "To" in the forth line. Header "From" contains data including the telephone number of the source IP phone 101, which is "813 10000000". Header "To" contains data including the telephone number of the destination IP phone 102, which is "81310000001".

[0047] Particularly, in the example shown in Fig. 9, @ is contained in header "From" and header "To". Before @ (to the left side of @ in the figure), the telephone numbers of the source and destination IP phones are described. Data contained in header "From" and header "To" is not limited to the example shown in the figure.

[0048] Upon receiving the "INVITE" message from IP phone 101, IP phone 102 retrieves, from header "From" in the "INVITE" message, the telephone number of the source IP phone 101. In this case, "81310000000" described before @ is extracted from header "From" shown in Fig. 9 as the telephone number of the source IP phone 101. When the telephone number is registered in the phonebook of IP phone 102, IP phone 102 displays, on display 204, information (e.g., names) registered in the phonebook data of IP phone 102. The following describes a case in which there is no data registered in the phone book.

[0049] IP phone 102 transmits, to ENUM server 103, an ENUM query for a NAPTR record corresponding to the telephone number in the same manner as IP phone 101 that has received the input telephone number (ST 806). In this case, IP phone 102 first converts telephone number "81310000000", which is extracted from the "INVITE" message, into "8.1.3.1.0.0.0.0.0.0.0" with dots inserted between the numbers. Next, the numbers are reversed, and data string ".e164.arpa" is added at the end. As a result, domain name "0.0.0.0.0.0.0.1.3.1.8. e164.arpa" is obtained. IP phone 101 then transmits the ENUM query for a NAPTR record corresponding to the domain name.

[0050] Upon receiving the ENUM query, ENUM server 103 searches for a NAPTR record corresponding to domain name "0.0.0.0.0.0.0.1.3.1.8. e164.arpa" and then transmits, to IP phone 102, an ENUM response including the corresponding NAPTR record (ST 807). In this case, ENUM server 103 retrieves the top NAPTR record among the NAPTR records shown in Fig. 5 and transmits, to IP phone 102, the ENUM response including the NAPTR record. When the ENUM response is transmitted to IP phone 102, IP phone 102 is notified that IP phone 101 is able to perform the SIP protocol and the http protocol.

[0051] Upon receiving the ENUM response including the NAPTR record, IP phone 102 accesses Web server

105 based on URI "//www.tokyo.sip.com/user8131-0000000.html" specified in the NAPTR record, which indicates that the destination terminal is able to perform the http protocol, and requests information regarding the user of the source IP phone 101 (hereafter referred to as "caller information") (ST 808). In response to the request, Web server 105 transmits caller information to IP phone 102 (ST 809). In this case, Web server 105 transmits caller information such as "Matsushita Tarou" shown in Fig. 7.

[0052] When the caller information is received, it is displayed on display 204 of IP phone 102. Therefore, the operator of IP phone 102 becomes to be able to determine whether to respond to the call after checking the caller information displayed on display 204. IP phone 102 also sounds a ringing tone at the same time as displaying the caller information. At the same time, IP phone 102 transmits, to IP phone 101, the " 180 Ringing" message (ST 810).

[0053] When an off-hook operation is detected at IP phone 102, IP phone 102 transmits, to IP phone 101, the "200 OK" message indicating a connection approval (ST 811). Upon receiving the "200 OK" message, IP phone 101 transmits the "ACK" message to IP phone 102 (ST 812). When IP phone 102 receives the "ACK" message, voice communication becomes possible between IP phone 101 and IP phone 102.

[0054] Fig. 10 illustrates a flow chart describing an operation of the destination IP phone 102 in the Fig. 8 sequence.

[0055] IP phone 102 monitors, in a standby state, for the reception of the "INVITE" message via IP network 105 (ST 1001). When the "INVITE" message is received, IP phone 102 extracts, from header "From" in the "INVITE" message, the caller number (ST 1002).

[0056] When the caller number is extracted, IP phone 102 transmit, to ENUM server 103, an ENUM query for a NAPTR record corresponding to the caller number (ST 1003). ENUM server 103 transmits, to IP phone 102, an ENUM response in response to the ENUM query, and IP phone 102 receives the ENUM response (ST 1004).

[0057] Upon receiving the ENUM response, IP phone 102 determines whether the NAPTR records in the ENUM response include the NAPTR record indicating that IP phone 101 is able to perform the http protocol (ST 1005).

[0058] When the NAPTR record indicating that IP phone 101 is able to perform the http protocol is included, IP phone 102 accesses Web server 105 according to the URI (URL) specified in the NAPTR record and requests caller information (ST 1006). Web server 105 transmits, to IP phone 102, the caller information in response to the request, and IP phone 102 obtains the caller information (ST 1007).

[0059] Upon obtaining the caller information, IP phone 102 displays the caller information on display 204 at the same time as sounding a ringing tone (ST 1008). IP phone 102 then determines whether the operator's on-hook operation is detected (ST 1009).

[0060] When the off-hook operation is detected, IP phone 102 transmits, to the source IP phone 101, the "200 OK" message indicating a connection approval (ST 1010). When IP phone 102 receives the "ACK" message transmitted from IP phone 101 in response to the "200 OK" message, the process proceeds to a talk process (ST 1011).

[0061] When it is determined in ST 1005 that there is no NAPTR record indicating that IP phone 101 is able to perform the http protocol, IP phone 102 transmits, to the source IP phone 101, the "486 BUSY" message indicating that no connection can be established (ST 1012) and terminates the process. When receiving the "486 BUSY" message, the source IP phone 101 determines that the communication was unsuccessful and terminates the process.

[0062] On the other hand, when it is determined in ST 1009 that no off-hook operation is detected, IP phone 102 determines, after waiting for a predetermined time, that the operator has no intention to respond to the call and terminates the process. The source IP phone 101 determines that the communication was unsuccessful because it is not able to receive, during an allocated time, the "200 OK" message indicating a connection approval and terminates the call process.

[0063] According to the IP telephone system of the present embodiment, Web server 105 transmits the caller information regarding the source IP phone 101 in response to a request from IP phone 102 that has received a call. The caller information is displayed on display 204 of IP phone 102 in order to present the caller information regarding IP phone 101 to the operator of the destination IP phone 102. This enables the operator of IP phone 102 to determine whether to respond to the call after confirming the caller information. As a result, the IP telephone system allows users to communicate safely with intentionally unblocked first-time callers while blocking unsolicited telemarketing calls.

[0064] Particularly, in the IP telephone system according to the present embodiment, IP phone 102 transmits, to Web server 105, a request for caller information according to the http protocol after receiving a call and obtains the caller information. Therefore, the caller information regarding IP phone 101 can be obtained by performing a communication control according to the http protocol.

[0065] When the http protocol is not specified in the service field of the NAPTR record transmitted from ENUM server 103, a connection to the source IP phone 101 is denied (ST 1012). This process can automatically reject calls from an IP telephone apparatus that does not specify the http protocol in the NAPTR record stored in ENUM server 103.

Second Embodiment

[0066] In the above-described IP telephone system ac-

cording to the present embodiment, it is possible to modify a configuration that connects an IP telephone apparatus to IP network 106 or to use different protocols when the destination IP phone 102 requests caller information from Web server 105. The following describes an IP telephone system according to the second embodiment of the present invention.

[0067] The IP telephone system according to the first embodiment is described as a case in which the destination IP phone 102 transmits, to Web server 106, a request for caller information according to the http protocol. However, the method for obtaining caller information is not limited to requesting caller information from Web server 106 according to the http protocol. For example, the IP telephone system may be configured to request caller information from a database server that is separately provided, using an LDAP (Lightweight Directory Access Protocol) or an FTP (File Transfer Protocol).

[0068] Fig. 11 illustrates an example of a NAPTR record stored in DB 403 of ENUM server 103 according to the second embodiment of the present invention.

[0069] The NAPTR record shown in Fig. 11 differs from the NAPTR record shown in Fig. 5 in that it has different data in the service field and the URI scheme. More specifically, the NAPTR record in Fig. 11 specifies the LDAP instead of the http in the service field and the URI scheme.

[0070] Even when DB 403 of ENUM server 103 stores the NAPTR record shown in Fig. 11, the destination IP phone 102 is able to request caller information from the database server using the LDAP. This enables the operator to determine whether to respond to the call according to the caller information. As a result, the IP telephone system according to the second embodiment can provide the same advantages as the IP telephone system according to the first embodiment.

[0071] The IP telephone system according to the first embodiment is described as a case in which IP phone 101 obtains a URI from ENUM server 103 and an IP address from DNS server 104, and then transmits the "INVITE" message to IP phone 102. When transmitting the "INVITE" message, IP phone 101 may be configured to transmit the "INVITE" message via a CA (Call Agent) provided on IP network 106. In this case, IP phone 101 does not need to obtain information such as a URI from ENUM server 103 or an IP address from DNS server 104, since the CA performs a call control between IP phones 101 and 102.

[0072] Fig. 12 illustrates a sequence diagram describing operations until IP phone 101 performs voice communication with IP phone 102 in the IP telephone system according to the second embodiment.

[0073] The Fig. 12 sequence diagram differs from the Fig. 8 sequence diagram up to the process of transmitting the "INVITE" message from IP phone 101 to IP phone 102.

[0074] Individual IP telephone information need to be stored so that the CA can perform the call control between IP phones 101 and 102 on IP network 106. Therefore, as shown in Fig. 12, IP phone 101 needs to transmit the "Register" message to the CA, and the CA needs to returns the "200 OK" message to IP phone 101 (ST 1201, ST 1202). Similarly, IP phone 102 needs to transmit the "Register" message to the CA, and the CA needs to returns the "200 OK" message to IP phone 102 (ST 1203, ST 1204).

[0075] When the CA stores information regarding each IP telephone, the process is not limited to a case where IP phone 101 first stores information as shown in Fig. 12. In a reverse configuration from Fig. 12, it is possible to have IP phone 102 first store information.

[0076] When information for each IP telephone apparatus is stored as described above, IP phone 101 is able to transmit, to IP phone 102, the "INVITE" message via the CA using the telephone number of IP phone 102. When receiving the "INVITE" message, IP phone 102 obtains caller information as described in ST 806 - ST 809. The operator is able to determine whether to respond to the call according to the caller information, which provides the same advantages as the IP telephone system according to the first embodiment of the present invention.

[0077] Furthermore, the IP telephone system of the first and second embodiments are described as a case in which a call control is performed between IP phones 101 and 102 according to the SIP protocol. However, the call control between IP phones 101 and 102 is not limited to the operation performed according to the SIP protocol and may be performed according to other protocols. For example, the call control may be performed between IP phones 101 and 102 according to the H.323 protocol or an MGCP (Media Gateway Control Protocol).

Third Embodiment

[0078] Fig. 13 illustrates a sequence diagram describing operations until IP phone 101 performs communication with IP phone 102 in the IP telephone system according to the third embodiment of the present invention.

[0079] Fig. 13 differs from the Fig. 8 sequence diagram in that messages used in the call control operation performed between IP phones 101 and 102 are communicated via a gatekeeper (GK).

[0080] Upon receiving the IP address response as shown in Fig. 13, IP phone 101 transmit, to IP phone 102, the "SETUP" message via the GK (ST 1301). Also, when receiving caller information from Web server 105, IP phone 102 transmits, to IP phone 101, the "Alerting" message via the GK (ST 1302). Furthermore, when detecting the off-hook operation, IP phone 102 transmits, to IP phone 101, the "Connect" message via the GK (ST 1303). When IP phone 101 receives the "Connect" message, negotiations according to the H.245 procedure take place between IP phones 101 and 102 via the GK (ST 1304), after which voice communication becomes possible.

[0081] Fig. 14 illustrates a flow chart describing an operation of the destination IP phone 102 in the Fig. 13

sequence.

[0082] The Fig. 14 sequence differs from the Fig. 10 operating sequence in that IP phone 101 in Fig. 14 monitors for the reception of the "SETUP" message instead of the "INVITE" message (ST 1401), that the "Connect" message instead of the "200 OK" message is transmitted when the operator's off-hook operation is detected (ST 1402), that negotiations according to the H.245 procedure take place after the "Connect" message is transmitted (ST 1403), and that the "Release Complete" message is transmitted when it is determined in ST 1005 that there is no NAPTR record indicating that the destination terminal is able to perform the http protocol (ST 1404).

[0083] As described above, when the call control according to the H.323 protocol is performed between IP phones 101 and 102, upon receiving the "SETUP" message, IP phone 102 obtains caller information in the same manner as ST 806 - ST 809 (ST 1002 - ST 1007). The operator then becomes able to determine whether to respond to the call according to the caller information, which provides the same advantages as the IP telephone system according to the first and second embodiments of the present invention.

[0084] In the IP telephone system according to the embodiments, the voice is not limited to the human voice. It also includes sounds in general, for example, modem signals modulated to voice bands and fax signals. Also, the telephone can be a fax apparatus as well.

[0085] Furthermore, in the IP telephone system according to the embodiments, the IP phone is described as a single device. However, the embodiments are not limited to this case. In other words, the IP phone can be configured by connecting an ordinary telephone apparatus to a control adapter that has a function which uses the connected ordinary telephone apparatus as an IP phone. In this illustration, the ordinary telephone apparatus is a telephone apparatus that has no voice communication functions via IP network 106.

[0086] The IP telephone described above includes an IP telephone defined by the government and operated by a telecommunications provider. It also includes an IP telephone provided on a local network or a private network using TCP/IP or other computer network protocols.

[0087] It is noted that the foregoing examples have been provided merely for the purpose of explanation and are in no way to be construed as limiting of the present invention. While the present invention has been described with reference to exemplary embodiments, it is understood that the words which have been used herein are words of description and illustration, rather than words of limitation. Changes may be made, within the purview of the appended claims, as presently stated and as amended, without departing from the scope and spirit of the present invention in its aspects. Although the present invention has been described herein with reference to particular structures, materials and embodiments, the present invention is not intended to be limited to the particulars disclosed herein; rather, the present invention extends to all functionally equivalent structures, methods and uses, such as are within the scope of the appended claims.

[0088] The present invention is not limited to the above described embodiments, and various variations and modifications may be possible without departing from the scope of the present invention.

[0089] This application is based on the Japanese Patent Application No. 2004 - 211618 filed on July 20, 2004 entire content of which is expressly incorporated by reference herein.

Claims

1. An IP telephone system comprising:

a Web server configured to store predetermined information regarding a user of a calling IP telephone apparatus corresponding to a predetermined URI;
an ENUM server configured to store a NAPTR (Naming Authority Pointer) resource record, the NAPTR resource record including an ENUM domain name corresponding to the predetermined URI stored in the Web server; and
an IP telephone apparatus, comprising:

a display configured to display data; and
a controller configured to:

receive, from the calling IP telephone apparatus, a predetermined message command for a connection with the IP telephone apparatus, the predetermined message command including a telephone number of the calling IP telephone apparatus;
generate an ENUM domain name based on the telephone number of the calling IP telephone apparatus;
transmit, to the ENUM server, a request for transmitting, to the IP telephone apparatus, the NAPTR resource record corresponding to the generated ENUM domain name;
receive, from the ENUM server, the corresponding NAPTR resource record;
access the Web server, based on the predetermined URI included in the received NAPTR resource record;
receive, from the Web server, the predetermined information regarding the user of the calling IP telephone apparatus corresponding to the predetermined URI; and
control the display to display the received predetermined information re-

garding the user of the calling IP telephone apparatus.

2. The IP telephone system according to claim 1, wherein the predetermined information regarding the user of the calling IP telephone apparatus comprises one of a telephone number of the calling IP telephone apparatus, a name of the user, an address of the user, an e-mail address of the user, and photo data representing a face of the user.

3. The IP telephone system according to claim 1, wherein the predetermined message command comprises an INVITE message specified in a SIP protocol.

4. The IP telephone system according to claim 1, wherein the predetermined message command comprises a SETUP message specified in a H.323 protocol.

5. The IP telephone system according to claim 1, wherein the NAPTR resource record stored in the ENUM server indicates a predetermined protocol utilized for accessing the Web server, and the IP telephone apparatus accesses the Web server based on the predetermined protocol.

6. The IP telephone system according to claim 5, wherein, when the NAPTR resource record received by the IP telephone apparatus does not indicate the predetermined protocol, the IP telephone apparatus transmits, to the calling IP telephone apparatus, a message command indicating that the IP telephone apparatus is unavailable.

7. The IP telephone system according to claim 5, wherein the predetermined protocol comprises a HTTP protocol.

8. The IP telephone system according to claim 5, wherein the predetermined protocol comprises a LDAP protocol.

9. An IP telephone apparatus connected to a Web server and to an ENUM server, the Web server storing predetermined information regarding a user of a calling IP telephone apparatus corresponding to a predetermined URI, the ENUM server storing a NAPTR (Naming Authority Pointer) resource record, the NAPTR resource record including an ENUM domain name corresponding to the predetermined URI stored in the Web, the IP telephone apparatus comprising:

a display configured to display data; and
a controller configured to:

receive, from the calling IP telephone apparatus, a predetermined message command for a connection with the IP telephone apparatus, the predetermined message command including a telephone number of the calling IP telephone apparatus;
generate an ENUM domain name based on the telephone number of the calling IP telephone apparatus;
transmit, to the ENUM server, a request for transmitting, to the IP telephone apparatus, the NAPTR resource record corresponding to the generated ENUM domain name;
receive, from the ENUM server, the corresponding NAPTR resource record;
access the Web server, based on the predetermined URI included in the received NAPTR resource record;
receive, from the Web server, the predetermined information regarding the user of the calling IP telephone apparatus corresponding to the predetermined URI; and
control the display to display the received predetermined information regarding the user of the calling IP telephone apparatus.

10. The IP telephone apparatus according to claim 9, wherein the predetermined information regarding the user of the calling IP telephone apparatus comprises one of a telephone number of the calling IP telephone apparatus, a name of the user, an address of the user, an e-mail address of the user, and photo data representing a face of the user.

11. The IP telephone apparatus according to claim 9, wherein the predetermined message command comprises an INVITE message specified in a SIP protocol.

12. The IP telephone apparatus according to claim 9, wherein the predetermined message command comprises a SETUP message specified in a H.323 protocol.

13. The IP telephone apparatus according to claim 9, wherein the NAPTR resource record indicates a predetermined protocol utilized for accessing the Web server, and the controller accesses the Web server based on the predetermined protocol.

14. The IP telephone apparatus according to claim 13, wherein, when the received NAPTR resource record does not indicate the predetermined protocol, the controller transmits, to the calling IP telephone apparatus, a message command indicating that the IP telephone apparatus is unavailable.

15. The IP telephone apparatus according to claim 13,

wherein the predetermined protocol comprises a HTTP protocol.

16. The IP telephone apparatus according to claim 13, wherein the predetermined protocol comprises a LDAP protocol.

17. A method for communicating with a calling IP telephone apparatus via the Internet using a called IP telephone apparatus, the called IP telephone apparatus being connected to a Web server and to an ENUM server, the Web server storing predetermined information regarding a user of the calling IP telephone apparatus corresponding to a predetermined URI, the ENUM server storing a NAPTR (Naming Authority Pointer) resource record, the NAPTR resource record including an ENUM domain name corresponding to the predetermined URI stored in the Web, the method comprising:

receiving, from the calling IP telephone apparatus, a predetermined message command for a connection with the IP telephone apparatus, the predetermined message command including a telephone number of the calling IP telephone apparatus;
generating an ENUM domain name based on the telephone number of the calling IP telephone apparatus;
transmitting, to the ENUM server, a request for transmitting, to the IP telephone apparatus, the NAPTR resource record corresponding to the generated ENUM domain name;
receiving, from the ENUM server, the corresponding NAPTR resource record;
accessing the Web server, based on the predetermined URI included in the received NAPTR resource record;
receiving, from the Web server, the predetermined information regarding the user of the calling IP telephone apparatus corresponding to the predetermined URI; and
displaying the received predetermined information regarding the user of the calling IP telephone apparatus.

18. The method according to claim 17, wherein the predetermined information regarding the user of the calling IP telephone apparatus comprises one of a telephone number of the calling IP telephone apparatus, a name of the user, an address of the user, an e-mail address of the user, and photo data representing a face of the user.

19. The method according to claim 17, wherein the NAPTR resource record indicates a predetermined protocol utilized for accessing the Web server, the accessing comprising accessing the Web server based on the predetermined protocol.

20. The IP telephone apparatus according to claim 19 further comprising transmitting, to the calling IP telephone apparatus, a message command indicating that the IP telephone apparatus is unavailable, when the received NAPTR resource record does not indicate the predetermined protocol.

Fig.1

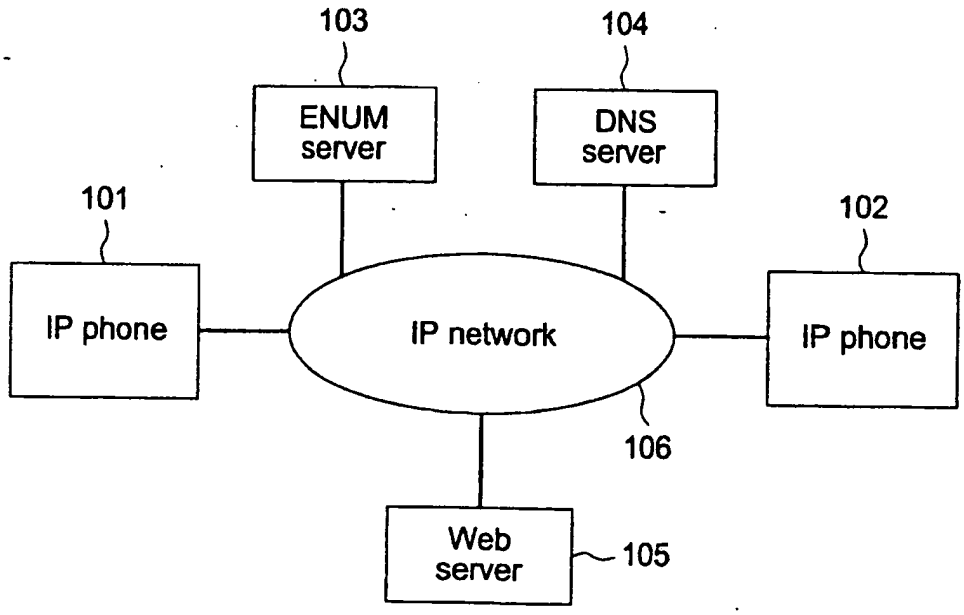

103
104
ENUM server
DNS server
101
102
IP phone
IP network
IP phone
106
Web server
105

Fig.2

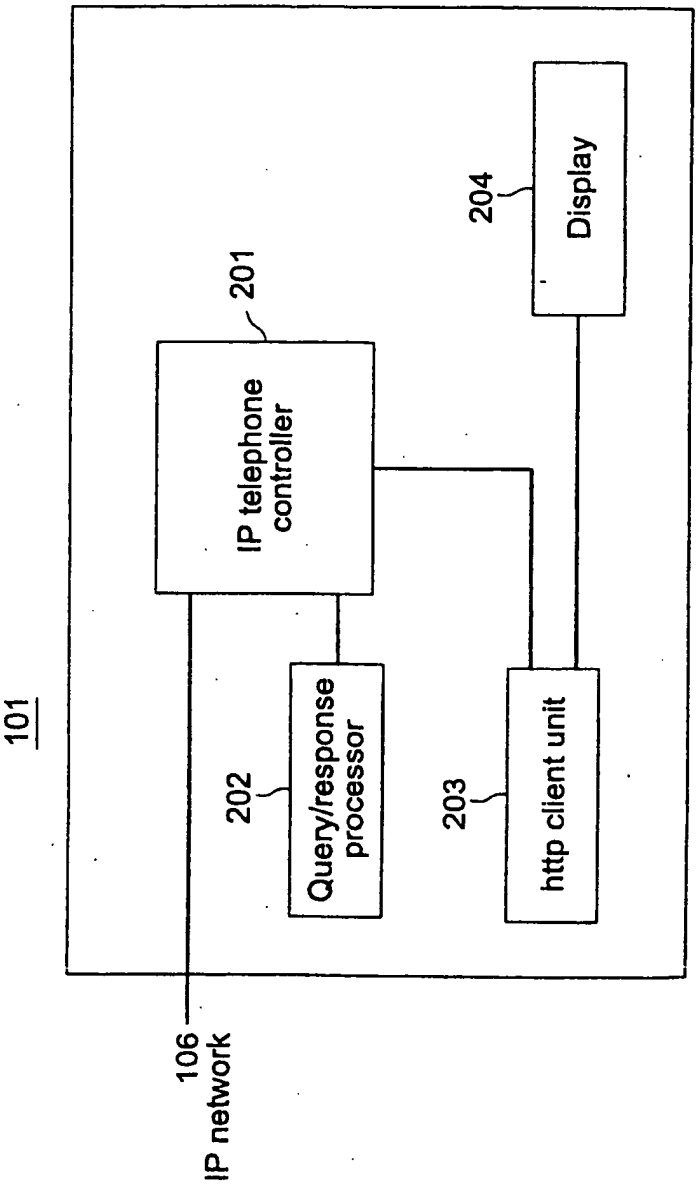

101
IP telephone controller
201
Display
204
Query/response processor
202
http client unit
203
106
IP network

Fig.3

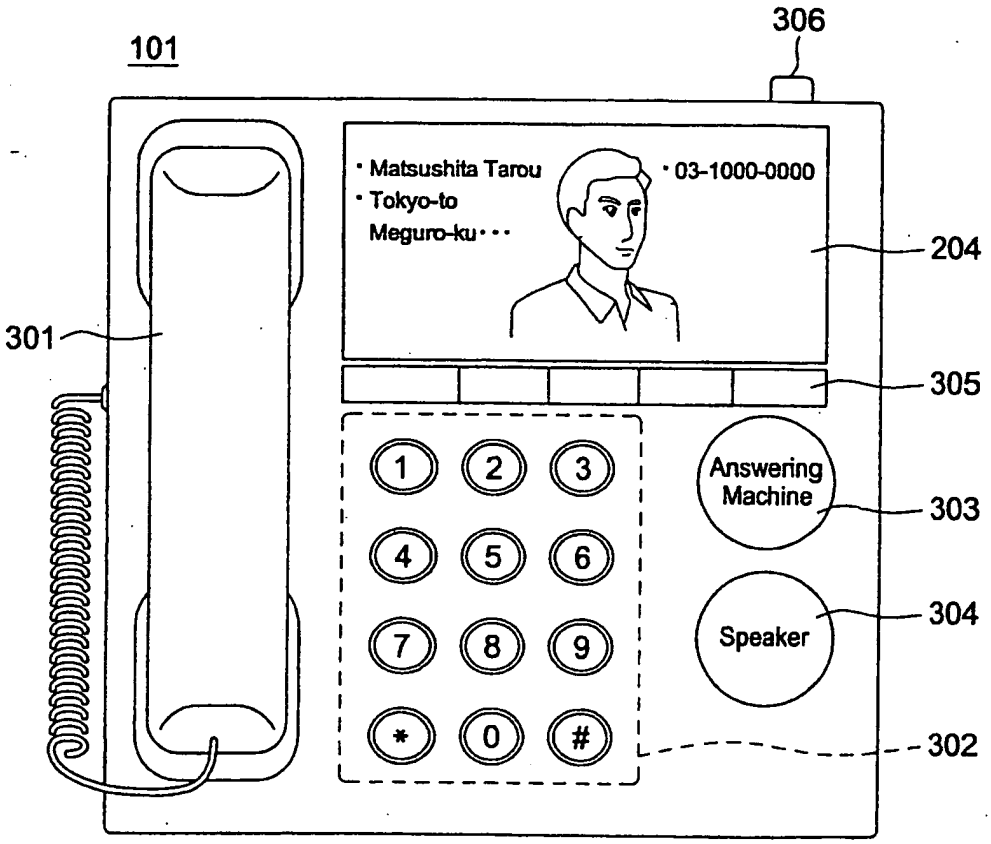

101
306
• Matsushita Tarou
• Tokyo-to
Meguro-ku • • •
• 03-1000-0000
204
301
305
1
2
3
4
5
6
7
8
9
*
0
#
Answering Machine
303
Speaker
304
302

Fig.4

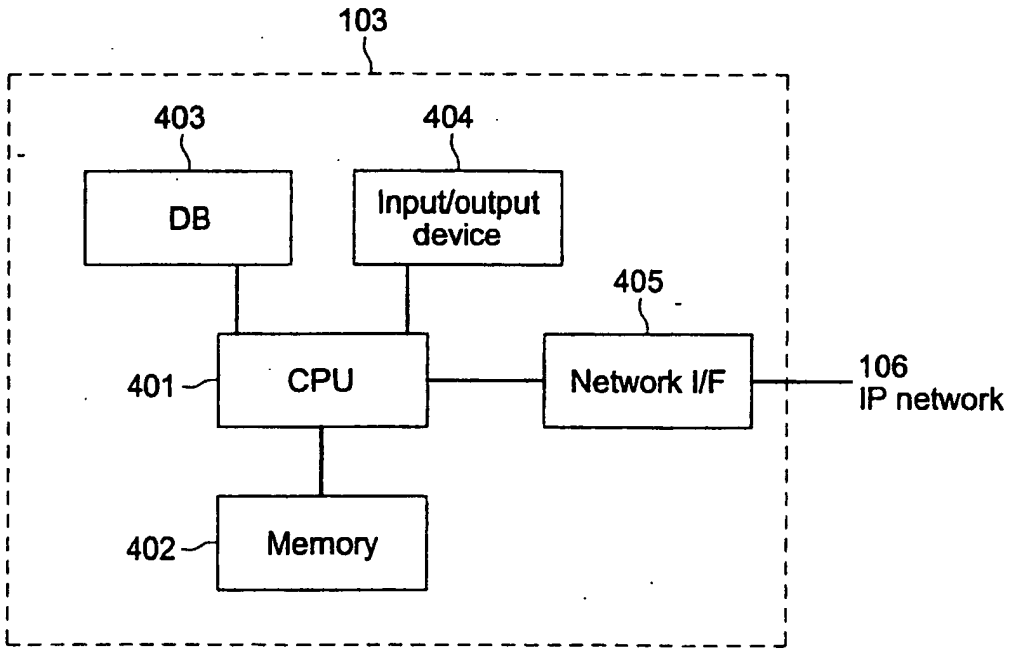

103
403
404
DB
Input/output device
405
401
CPU
Network I/F
106
IP network
402
Memory

Fig.5

NAPTR resource record

Enum domain name		Order	Preference	Flags	Service		URI scheme
							URI
0.0.0.0.0.0.0.1.3.1.8.e164.arpa	IN NAPTR	100	10	"u"	"E2U+sip"	"!^.*$!sip:	81310000000@tokyo.sip.jp"
	IN NAPTR	100	10	"u"	"E2U+http"	"!^.*$!http:	//www.tokyo.sip.com/user81310000000.html"
1.0.0.0.0.0.0.1.3.1.8.e164.arpa	IN NAPTR	100	10	"u"	"E2U+sip"	"!^.*$!sip:	81310000001@tokyo.sip.jp"
	IN NAPTR	100	10	"u"	"E2U+http"	"!^.*$!http:	//www.tokyo.sip.com/user81310000001.html"

Fig.6

URI	IP address
81310000000@tokyo.sip.jp	192.168.1.1
81310000001@tokyo.sip.jp	192.168.1.2
81310000002@tokyo.sip.jp	192.168.1.3
81310000003@tokyo.sip.jp	192.168.1.4

Fig.7

//www.tokyo.sip.com/user81310000000.html

```
<html>
<head>caller</head>
<body>
Matsushita Tarou
TEL:03-1000-0000
Address:Tokyo-to,meguro-ku
<img svc="tarou-matsushita.jpg" width="10",height="26">
</body>
</html>
```

//www.tokyo.sip.com/user81310000001.html

```
<html>
<head>caller</head>
<body>
Matsushita Hanako
TEL:03-1000-0001
Address:Tokyo-to,shinjuku-ku
<img svc="hanako-matsushita.jpg" width="10",height="26">
</body>
</html>
```

Fig.8

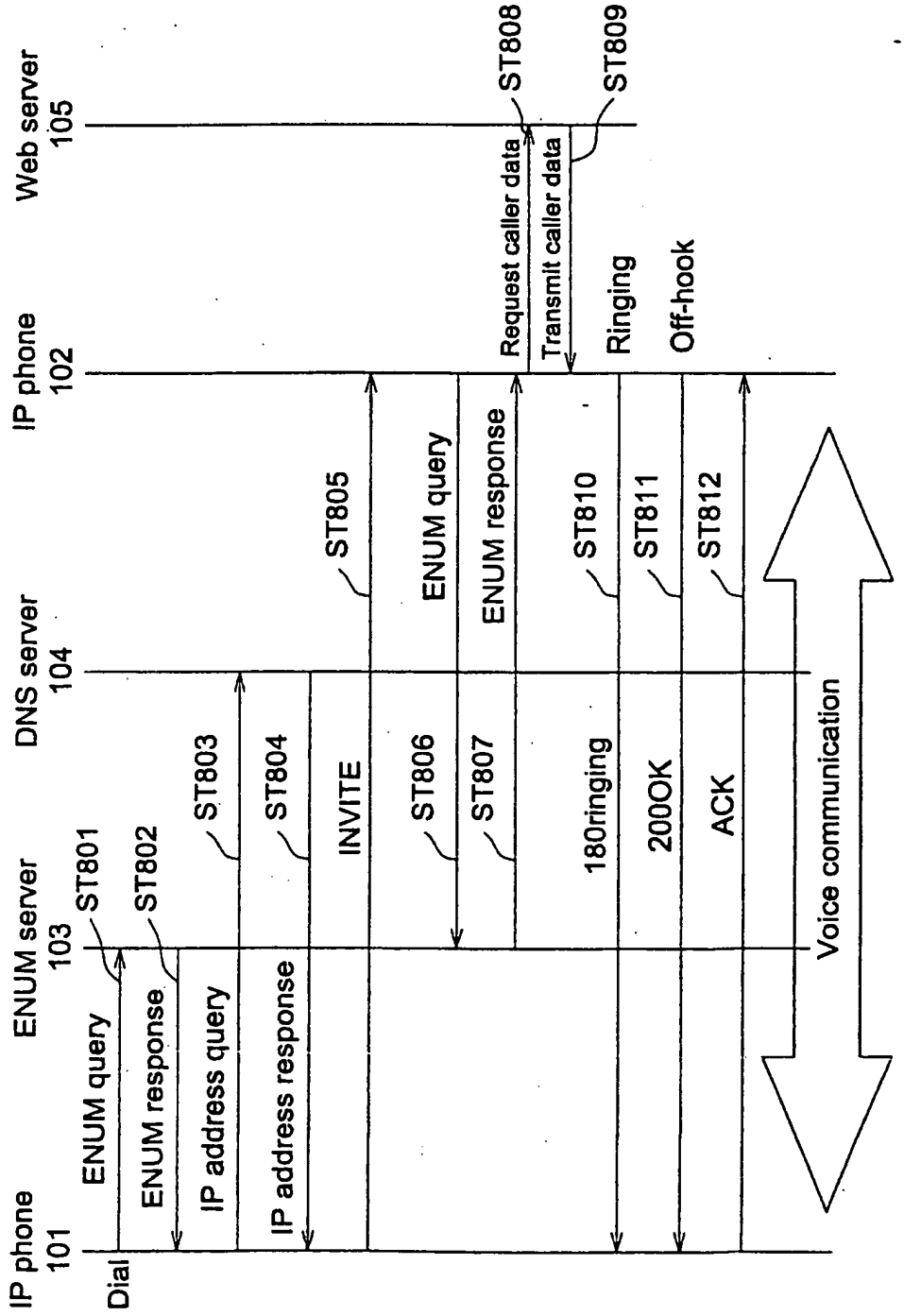

IP phone 101
ENUM server 103
DNS server 104
IP phone 102
Web server 105
Dial
ENUM query
ST801
ENUM response
ST802
IP address query
ST803
IP address response
ST804
INVITE
ST805
ENUM query
ST806
ENUM response
ST807
Request caller data
ST808
Transmit caller data
ST809
180ringing
ST810
Ringing
200OK
ST811
Off-hook
ACK
ST812
Voice communication

Fig.9

INVITE sip:81310000001@tokyo.sip.jp SIP/2.0
Via:SIP/2.0/UDP Tokyo.sip.jp:5060;branch=z9hG4bk776as3
From:81310000000@tokyo.sip.jp;tag=r18f061962
To:81310000001@tokyo.sip.jp

Fig.10

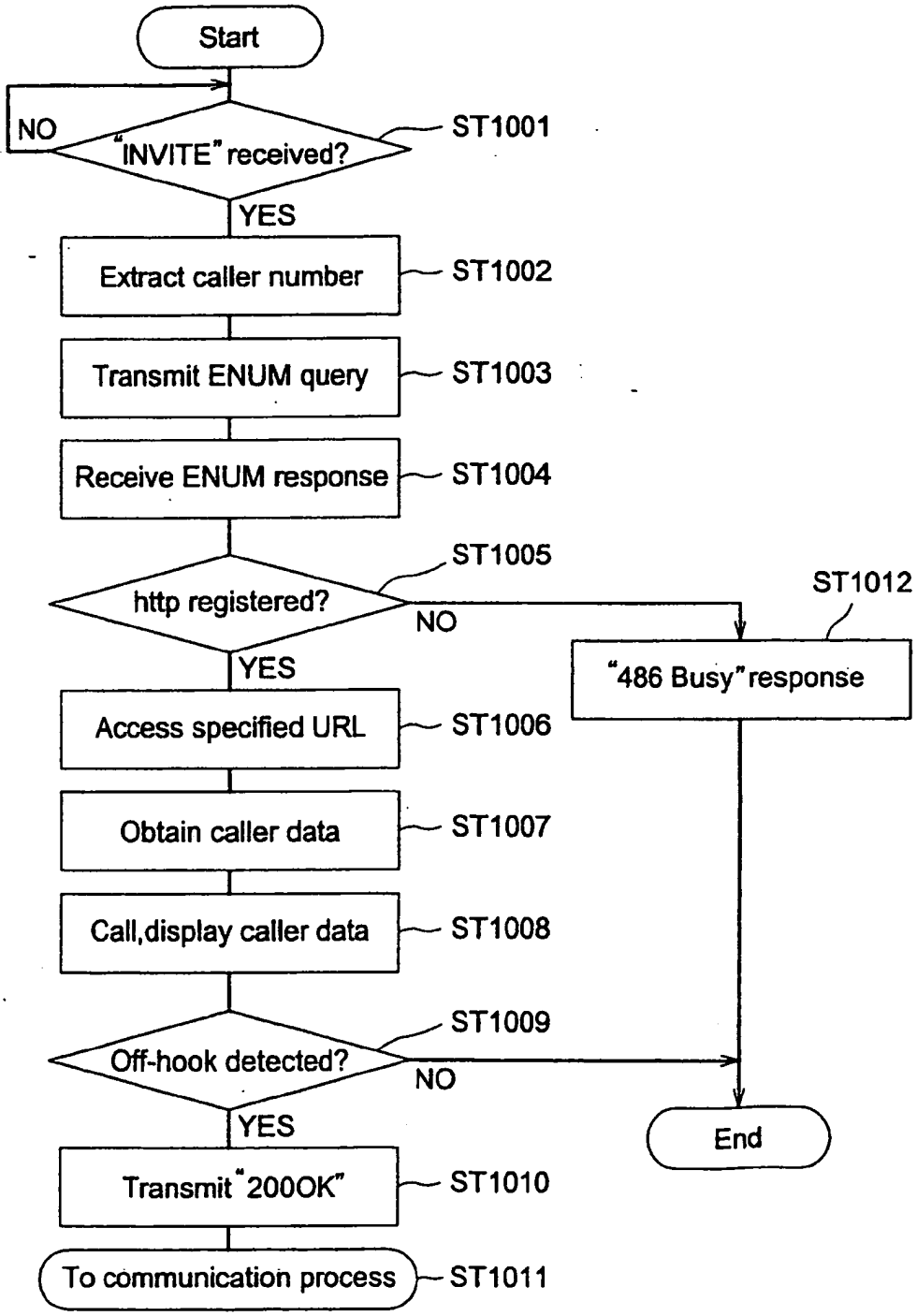

Start
NO
"INVITE" received?
ST1001
YES
Extract caller number
ST1002
Transmit ENUM query
ST1003
Receive ENUM response
ST1004
ST1005
http registered?
NO
ST1012
"486 Busy" response
YES
Access specified URL
ST1006
Obtain caller data
ST1007
Call,display caller data
ST1008
ST1009
Off-hook detected?
NO
End
YES
Transmit "200OK"
ST1010
To communication process
ST1011

Fig.11

NAPTR resource record

Enum domain name		Order	Preference	Flags	Service	URI scheme	URI
0.0.0.0.0.0.0.1.3.1.8.e164.arpa	IN NAPTR	100	10	" u "	"E2U+sip"	"!^.*$!sip:	81310000000@tokyo.sip.jp "
	IN NAPTR	100	10	" u "	"E2U+ldap"	"!^.*$!ldap:	//dap.tokyo.ldap.com/user81310000000."
1.0.0.0.0.0.0.1.3.1.8.e164.arpa	IN NAPTR	100	10	" u "	"E2U+sip"	"!^.*$!sip:	81310000001@tokyo.sip.jp "
	IN NAPTR	100	10	" u "	"E2U+ldap"	"!^.*$!ldap:	//dap.tokyo.ldap.com/user81310000001."

Fig.12

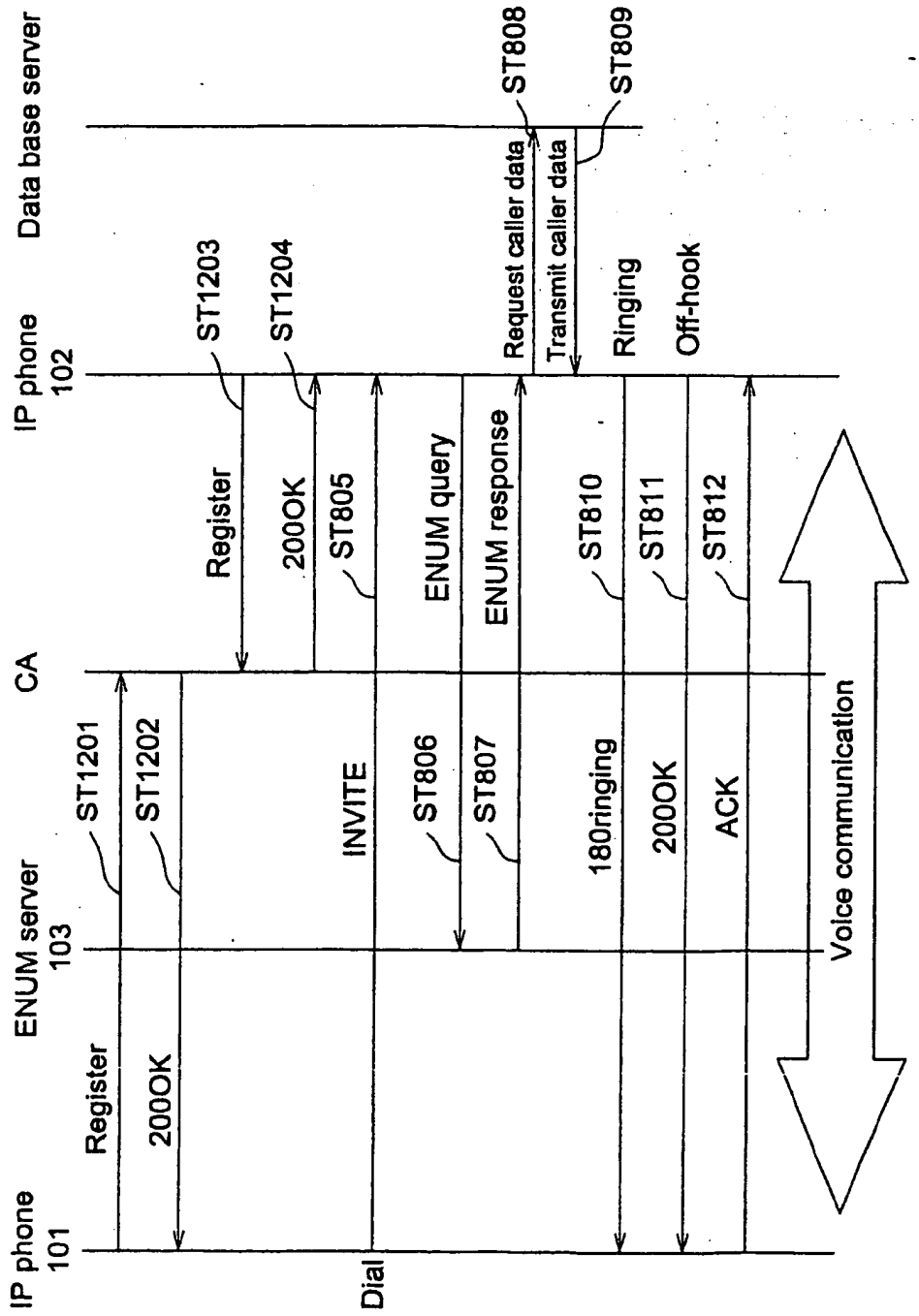

IP phone 101
ENUM server 103
CA
IP phone 102
Data base server
Register
200OK
ST1201
ST1202
ST1203
ST1204
INVITE
ST806
ST807
ST805
ENUM query
ENUM response
ST808
Request caller data
Transmit caller data
ST809
180ringing
Ringing
ST810
200OK
Off-hook
ST811
ACK
ST812
Dial
Voice communication

Fig.13

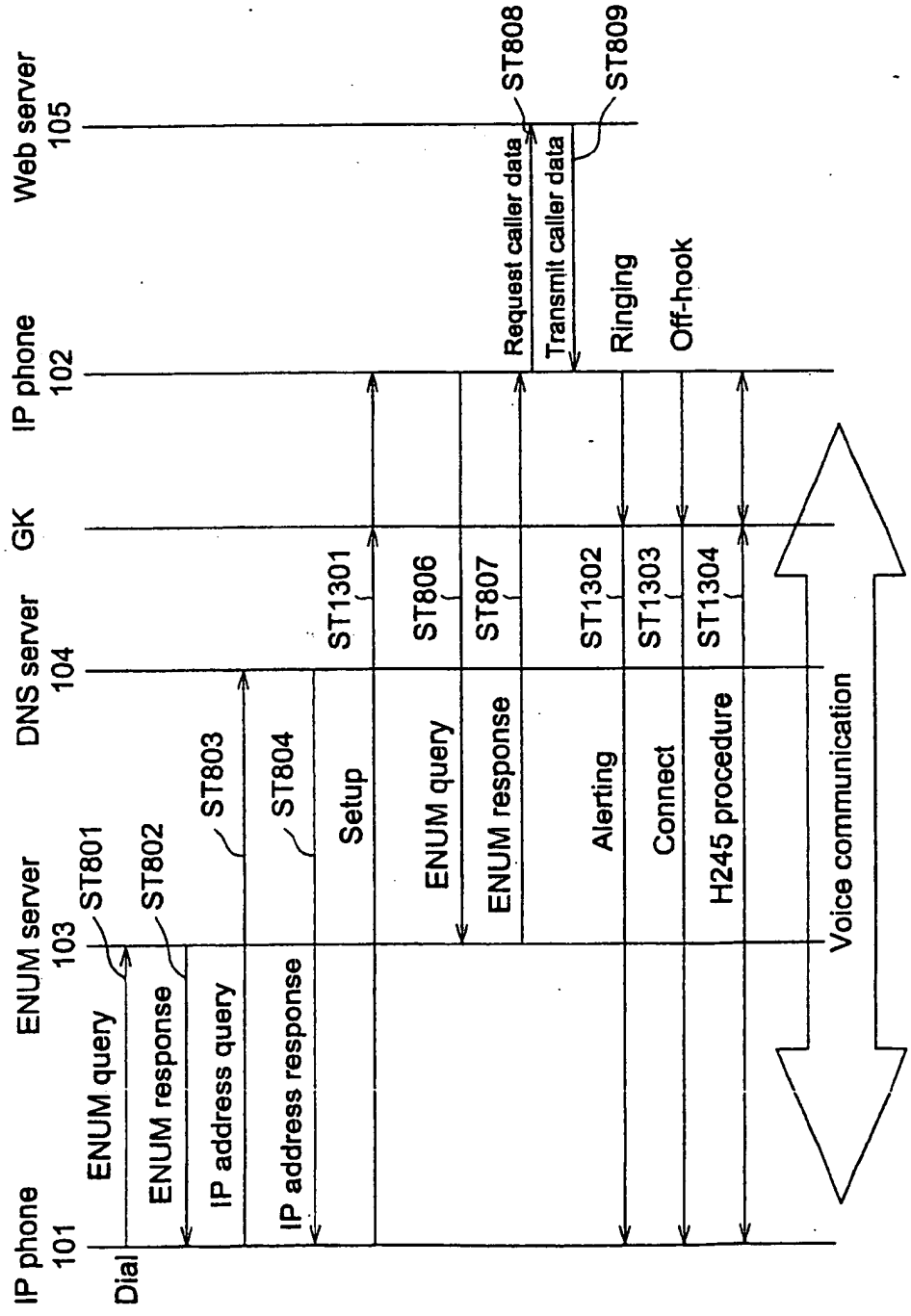
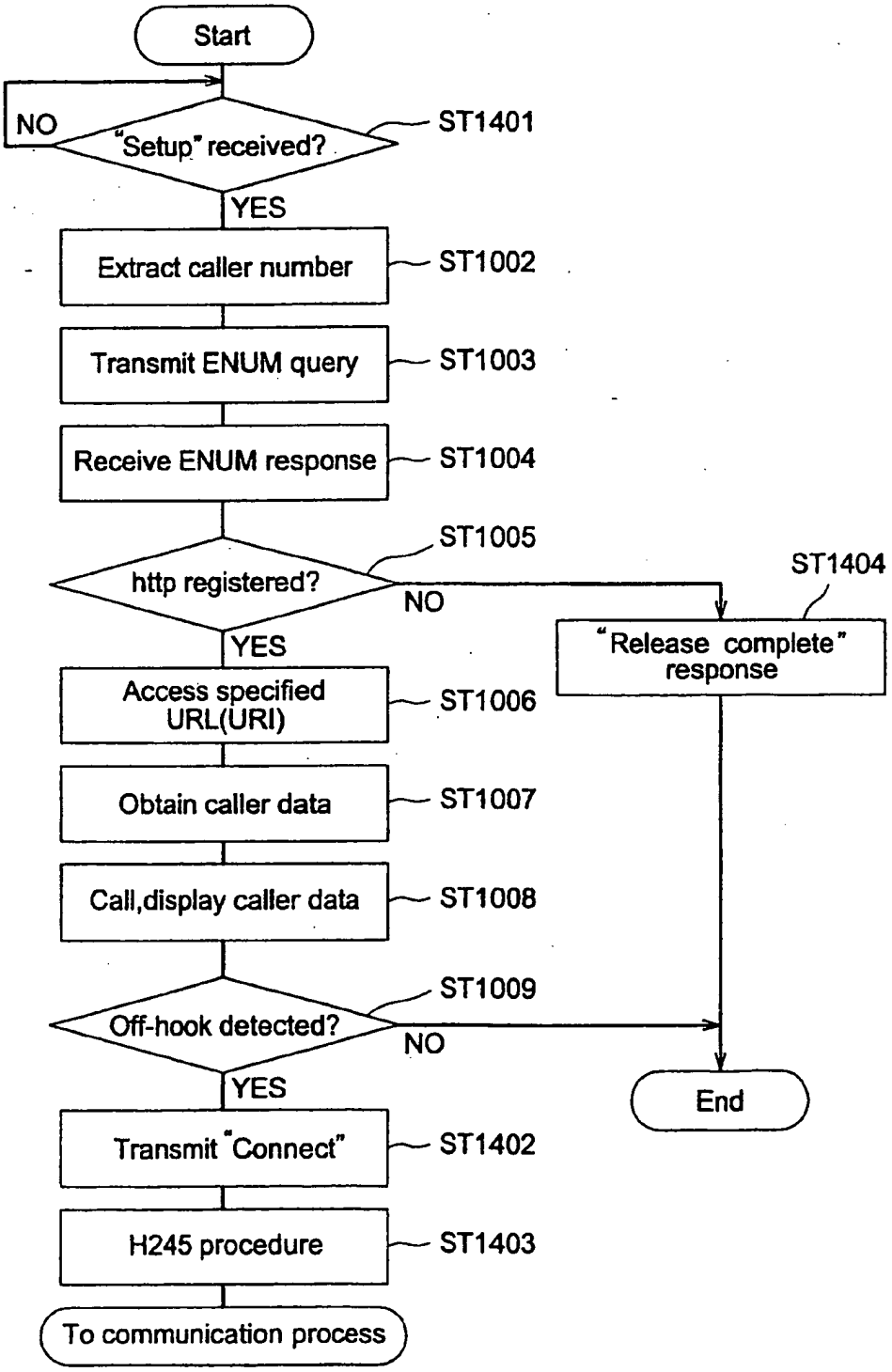

IP phone 101
ENUM server 103
DNS server 104
GK
IP phone 102
Web server 105
Dial
ENUM query
ST801
ENUM response
ST802
IP address query
ST803
IP address response
ST804
Setup
ST1301
ENUM query
ST806
ENUM response
ST807
Request caller data
ST808
Transmit caller data
ST809
Ringing
Alerting
ST1302
Off-hook
Connect
ST1303
H245 procedure
ST1304
Voice communication

Fig.14


Start
NO
"Setup" received?
ST1401
YES
Extract caller number
ST1002
Transmit ENUM query
ST1003
Receive ENUM response
ST1004
ST1005
http registered?
NO
ST1404
"Release complete" response
YES
Access specified URL(URI)
ST1006
Obtain caller data
ST1007
Call,display caller data
ST1008
ST1009
Off-hook detected?
NO
End
YES
Transmit "Connect"
ST1402
H245 procedure
ST1403
To communication process